SUPPLY CHAIN INTEGRATION AND ORGANIZATIONAL PERFORMANCE OF KENYA MEDICAL SUPPLIES AUTHORITY

MUTWIRI IREEN NKIROTE

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DECLARATION

I declare that this thesis is my original work and has not been presented for a degree in any other university.

Signature …… ……

Mutwiri Ireen Nkirote **Date**

Reg. No: B212-02-0018/2014

This thesis has been submitted for examination with my approval as university supervisor.

Signature ……... …….

Dr. Pamela Nyaboke -Getuno **Date**

School of Business Management and Economics

Dedan Kimathi University of Technology

Signature ……... ……

Dr. George K Riro **Date**

School of Business Management and Economics

Dedan Kimathi University of Technology

DEDICATION

Special dedication goes to my parents, Mr. and Mrs. Mutwiri for their continued support in my academics.

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ABSTRACT

Research has accumulated a stock of knowledge on the importance of supply chain integration (SCI), but little is known on its worth in public health supply chains. For over a decade now, the Kenya government has considerably increased funding to the Kenya Medical Supplies Authority (KEMSA) but logistical shortcomings and weak links continue to hamper the performance of this health supply chain. This has had serious consequences on the quality of human health care. But that notwithstanding, research has hardly been carried out to assess the influence of supply chain integration on organizational performance in public health supply chains. This study sought to establish the relationship between of supply chain integration and organizational performance KEMSA. Specifically, the study examined the effect of supplier integration, internal integration, customer integration and information integration on organizational performance. The study was anchored on Process-Based Management Theory, Network Theory, Stakeholder Theory and Transaction Cost Theory and the SCOR reference model. The study employed cross section research design and targeted a population of one hundred and twenty three (123) respondents within the management and supervisory level of the organization. Stratified random sampling technique was used to obtain the sample size of ninety three (93) respondents. Primary data was collected through administering a research questionnaire whereas secondary data was obtained from the company's website and from the ministry of public health. Data was analysed through descriptive statistics, correlation and multiple regression. Findings from the research revealed that supplier integration, internal integration and customer integration have a positive and statistically significant effect on organizational performance. Information integration was found not to have significant influence on organizational performance. Results also showed that the effect of the combined supply chain integration dimensions have positive and statistically significant effect on organizational performance. The combined influence of supply chain integration dimensions was also found to be greater than their individual influence. This study contributes to theory by establishing that Process based-management, stakeholder's and transaction cost theory are elaborate in describing supply chain integration from an organization view point. The study also makes contribution to public management practice by establishing that supplier integration, internal integration and customer integration complements organizational performance. The study recommends for enhanced use of supplier, internal, and customer integration as strategic policies of improving organizational performance in public health supply chains.

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ABBREVIATIONS AND ACRONYMS

KEMSA:	Kenya Medical Supplies Authority
MOH:	Ministry of Health
SCM:	Supply Chain Management
SC:	Supply Chain
USAID:	United States Agency of International Development
SPSS:	Statistical Program for Social Scientists
SCI:	Supply chain integration
GSCF:	Global Supply Chain Forum
SCOR:	Supply Chain Operations Reference
SI:	Supplier Integration
II:	Internal Integration
CI:	Customer Integration
RBV	Resource Based View
OP	Organizational Performance
R&D	Research and Development

CHAPTER ONE

INTRODUCTION

This chapter covers the background of the study, problem environment, problem statement, purpose of the study, objectives of the study, research questions and significance of the study. The chapter also outlines the delimitation, limitations and assumptions of the study. Also contained in this chapter are the definitions of operational terms of the study.

1.1 Background of the Study

Supply Chain Integration (SCI) refers to the linkages between departments, functions, or business units within a firm, including the network of direct suppliers and their suppliers, and direct customers and their customers (Flynn, Huo, & Zhao, 2010; Jespersen & Larsen, 2005). This relationship which has become a key issue in understanding the effectiveness of the concept of supply chain in organizations management, is changing inter-organizational relationships as we know them today (Zhao, Huo, Selen, & Yeung, 2011). This association has been studied since the pioneering work by Lee and Whang (2004) with most literature explicitly or implicitly implying that firms should pursue maximal SCI to achieve the best performance outcomes. However, in public health supply chains, SCI has not been as straight forward as it appears on paper (Msimangira, 2010).

Although research has brought forth the importance of SCI in regard to the performance of the firm, Msimangira (2010) claims that the impact of SCI on organizational performance of public health supply chains - a network of interconnected organizations or actors that procure health items for the public –continue to be in the periphery of research. The public health supply chain

mainly comprises the departments of procurement, planning, and drug regulatory board, human resources, and health programs in the ministries of health; central medical stores; donors; non-governmental organizations; regions and districts; health facilities; community health workers; and private sector partners like third-party logistics providers, and drug manufacturers and distributors.

The body of literature on SCI in the public domain is inclined to the typical view that the more a firm is integrated the better is its performance results (Rosenzweig, 2009). However, the validity of this view may not apply in the context of public health supply chains, as the effects of SCI on public health supply chains is yet to be holistically understood (Msimangira, 2010). More importantly supply managers in the public sector must comply with constraining transparency and regulatory rules which do not apply in the private owned supply chains. Despite this and other constraints, they can achieve substantial savings by integrating the public sector requirements with private sector supply chain management concepts. However, current studies on the subject have not interrogated the relationship between SCI and the performance of public sector organizations. There is also no doubt that research on SCI in the public sector has not matched what has been undertaken in the private manufacturing and service sectors (Msimangira, 2014).

1.1.1 Organization Performance

Although several researchers have attempted to define the term organizational performance there has not emerged consensus on the right definition of the term and only few studies have used consistent definitions and measures (Kirby, 2005). Organizational performance is a significant construct mostly defined as a dependent variable which seeks to produce variations of

performance (Juliana & Luiz, 2012). Performance is the extent to which an organization achieves a set of pre-defined targets that are unique to its mission. Key performance drivers include: Strategic focus, customer value, leadership and team performance, culture, value and ethics, process excellence, talent management and knowledge management. Additionally, steps of organizational performance initiative are: Evaluation, planning, implementing and continuity (Albrecht, 2011). Research by Verbeeten and Bonns (2009) revealed that the measurement of how successful organizations are close to achieving performance has become a key issue in public sector governance. In this respect, a host of developing countries have embraced performance management tools to measure organizational and individual efficiency for explicit purpose that the public sector meets the needs of the public (Ohemeng, 2009). Bruijn (2007) observes that measuring performance of an organization is an honourable of telling it to account.

Heinrich (2007) adds that accountability is a central concern in public sector performance measurement. It is viewed as a warning, diagnosis and control system for keeping track of economy, efficiency, effectiveness and efficacy (Teelken & Smeenk, 2003). Critical success factors consist of access to appropriate expertise, planning, creative solutions and flexible process management (Karla, 2011). Ogolla (2012) argues that financial performance measures consists of return on assets, return on equity, profit, and market share; while non-financial performance measures consist of corporate social responsibility, innovation, responsiveness and employee development.

1.1.2 Supply Chain Integration and Organization Performance

Organizational performance is the efficiency and effectiveness of a firm (McCann, 2004) or how an organization achieves its market and financial goals (Kaplan & Norton, 2005). On the other hand performance measurement entails quantifying - quantitatively or qualitatively - the input, output or level of activity of an event or process (Kaplan & Norton, 2005). Hofer (1983) contends that organization performance is a contextual concept associated with the phenomenon being studied. Finally, Pandey (1999) is of the view that financial measures have been used in the history of the firm to measure organizational performance including profit, return on investment, and earnings per share, market share, revenue growth and current ratio.

Extensive literature that is largely inclined to private firms indicates that SCI has a positive impact on organizational performance, although the link is not fully conclusive. On one hand, SCI has been associated with efficiency related improvements, such as shortened process lead times, due to a seamless flow of information, materials and improved responsiveness (Bowersox *et al.*, 2003; Frohlich and Westbrook, 2001), decrease in pipeline inventory levels, arising from better information visibility and improved decision making (Bagchi *et al.*, 2005). On the other hand, studies by Koufteros *et al.,* (2005) and Gimenez and Ventura (2005), found no relationship between internal integration and operational performance. Further, the study by Stank *et al.,* (2001) found no association between supplier integration and operational performance.

1.1.3 Overview of Kenya Medical Supplies Authority Supply Chain

According to the Kenya Medical Supplies Authority (KEMSA) Act No. 20 of 2013, KEMSA is a State Corporation established by a legal notice issued under CAP 466 of the Laws of Kenya. It

is a health supply chain service company whose core mandate is to procure, warehouse and distribute drugs and medical supplies to prescribed public health programs, the national strategic stock reserve, prescribed essential health packages and national referral hospitals (KEMSA Act, 2013). KEMSA procures health commodities based on the budget it receives from the Ministry of Health. The entity then manages the receipt of these commodities from national and international suppliers to its warehouses in Nairobi (primarily at Embakasi although some products are stored at Commercial Street). The health commodities are then stored at KEMSA's warehouses and later distributed to over four thousand health facilities, some of which are at considerable distances from the main warehouse in Nairobi. The distribution to health facilities occurs on a quarterly basis based on quantities requisitioned by each health facilities. The frequency of distribution to rural health facilities (RHFs) is quarterly, while hospitals and larger urban health facilities receive more frequent deliveries. Transport from the KEMSA warehouse to the health facilities is carried out by private transporters that are contracted on a long term basis.

1.2 Problem Environment

Although research has established that a strong health system cannot function without a well-designed, well-operated, and well-maintained supply chain management system, the Kenya public health supply chain is under increased pressure to operate efficiently (Amemba, 2014) in order to cope with its widening portfolio and the expansion of health services in the new devolved units. These developments have called for a flexible supply chain capable of responding to the changing environment. However, in spite of increased funding to KEMSA, the health supply chain still exhibits weak links which remain a hindrance in accessing essential health products (Johnson, Hazemba, Kimeu, Kirika, & Thuo, 2008; Njagi & Ogutu, 2014).

In Kenya, the total supply cost does not constitute a major portion of the direct overall healthcare expenditure, but the importance of supply chain integration cannot be overemphasized. However, an effective supply chain could bring down the direct cost of providing patient care, and offer other important benefits like ensuring availability, reducing counterfeits, increasing responsiveness, increasing resilience, and increasing choices, reducing waste, increasing drug utilization, and reducing medication errors. A robust and effective supply system will also relieve the caregivers the duties and stress associated with concerns regarding availability and quality of medicine, thus allowing them to focus on their core mandates (Msimangira, 2010).

Since the inception of KEMSA in 2000 there have been multiple projects and initiatives to improve its performance, but in spite of these efforts, KEMSA like any other organization in the public sector, continues to struggle to effectively deliver its mandate (Yadav, 2014). Additionally, KEMSA has experienced significant operational changes with the coming of the 47 devolved governments in 2013. This is despite the fact that the government, donors and policymakers are keen on each link in this supply chains to perform optimally. This calls for a strong and fully integrated public health supply system that is well-designed, well-operated, and well-maintained-one that can ensure an adequate supply of essential health commodities to the citizens.

1.3 Statement of the Problem

Since 2003, the Kenya government has considerably increased funding to the KEMSA (RoK, 2016), but logistical shortcomings and weak links continue to hamper the performance of this health supply chain. This has had serious consequences on the quality of human health care in

the country's public health supply chain (Yadav, 2014). But that notwithstanding, research has hardly been carried out to assess the influence of supply chain integration on organizational performance in public health supply chains (Amemba, 2013).

The typical view in the existing literature on SCI is that a greater level of integration leads to better firm performance (Cannon *et al.*, 2010; Rosenzweig, 2009). Proponents of this position argue that SCI reduces transaction costs of producing and distributing goods and services, increases revenue by reducing uncertainties for both buyers and suppliers, and enhances supply chain responsiveness (Vallet-Bellmunt & Rivera-Torres, 2013). However, opponents of this view have raised doubts on the impact of SCI on organization performance, adding that empirical studies have shown that supply chain integration does not necessarily enhance firm performance. SCI negative effects are to be expected if firms do not find a fit between integration and the environment in which they operate (Van der Vaart & Van Donk, 2008; Zhou & Benton, 2007).

Even though the debate on SCI is incomplete current studies on the subject have focused on the private sector (Cannon *et al.*, 2010; Rosenzweig, 2009), which significantly differ from the public sector (Zhao *et al.*, 2007). Moreover, the findings of these studies may not apply in the context of public corporations. Hence, we have insufficient knowledge on how SCI in public health supply chain influences organizational performance. Further, in the context of this study, extant literature has hardly examined the relationship between SCI and organizational performance in state corporations (Johnson *et al.*, 2008). This thesis aimed at closing the research gap by analyzing the relationship between supply chain integration and organizational performance of KEMSA.

1.4 Objectives of the Study

The general objective of this study was to analyze the relationship between supply chain integration and organizational performance of KEMSA.

1.4.1 Objectives of the Study

The study was guided by the following specific objectives;

i. To establish the relationship between supplier integration and organizational performance of KEMSA
ii. To determine the relationship between internal integration and organizational performance KEMSA
iii. To assess the relationship between customer integration and organizational performance KEMSA
iv. To establish the relationship between information integration and organizational performance of KEMSA

1.5. Research Hypothesis

The following null hypotheses guided the study;

H_{01}: There is no significant relationship between Supplier integration and Organizational Performance of KEMSA

H_{02}: There is no significant relationship between Internal Integration and Organizational Performance of KEMSA

H_{03}: There is no significant relationship between Customer Integration and Organizational Performance of KEMSA

H_{04}: There is no significant relationship between Information integration and Organizational Performance of KEMSA

1.6 Significance of the Study

This study aimed at assessing the relationship between supply chain integration and organizational performance of KEMSA, as well as give recommendations on the necessary improvements to entrench best practice to improve performance and customer satisfaction through integrative healthcare supply chain. The findings of this study will assist the management of KEMSA to deal with the shortcomings in its service delivery; challenges experienced in the supply of health care commodities, and provide guidance in the up scaling of its activities for improved service delivery.

Policy makers including the government will find the results of this study invaluable in the implementation of policies aimed at achieving effective supply chain management in public organizations. The policy makers will obtain knowledge of SCM dynamics and use the guidance obtained from this study in designing appropriate policies that can ensure effective logistics management especially in the health and medical sector. The study will also be useful to scholars and academicians, in the sense that it shall provide information to potential and current scholars on SCM in various organizations and others who wish to use the results for future research on SCI and organizational performance.

1.7 Delimitations of Study

The study mainly focused on the effects of supply chain integration on organizational performance. Specifically, the study sought to establish the relationship between SCI and organizational performance of KEMSA. The study thus evaluated literature that focus on SCI and organizational performance. Additionally, the study was delimited by the focus on

organizational performance, which means that the scientific literature used, could either be generalized to organizational performance, or relates to organizational performance in general.

1.8 Limitations of the Study

The study faced the challenge of seeking information from busy respondents who did not have enough time to spare to fill questionnaires. This challenge was resolved by issuing questionnaires to the respondents and allowing them to fill at their own convenience. Another constraint the researcher encountered was the unwillingness of respondents to give out the information for fear of victimization by the management for disclosing information perceived to be confidential to the organization. The problem was resolved by re- assuring the respondents that the information sought was not to be disclosed to the public and was only to be used for academic purposes.

1.9 Assumptions of the Study

The major assumption in this research was that the sample taken was a representative of the entire study population. The study also assumed that the administered questionnaires were to be answered truthfully; this was done by assuring the respondents that the answers given were to be treated with anonymity and confidentiality. The respondents were also informed that their participation was voluntary and they could withdraw from the study at any time and with no ramification.

1.10 Definitions of Significant Terms

Public Health Supply Chain- This is a network of interconnected organizations that ensures availability of health commodities to people who need them (Snow, 2012).

Supply Chain Integration- Degree to which an organization strategically collaborates with its supply chain partners and manages intra and inter-organization processes in order to achieve effective and efficient flows of products and services, information, money, and decisions with the objective of achieving the maximum value to the customer (Zhao *et al.*, 2008)

Internal Integration-Degree to which a manufacturer structures its own organizational strategies, practices and processes into collaborative, synchronized processes, in order to fulfill its customers' requirements and efficiently interact with its suppliers (Flynn *et al.*, 2010)

External Integration –Degree to which a manufacturer partners with its external partners to structure inter-organizational strategies, practices and processes into collaborative, and synchronized processes (Flynn *et al.*, 2010)

Customer Integration –Integration of core competencies derived from coordination with critical customers (Flynn *et al.*, 2010)

Supplier integration- Involves core competencies related to coordination with critical suppliers (Flynn *et al.*, 2010)

Information Integration - is the sharing of the key organizational processes within SCI including technological, marketing, production and inventory information (Flynn *et al.*, 2010)

Performance - is the ability to fulfill an obligation, to attain the set objectives, fulfill a requirement and accomplish something as promised or expected. Performance is the organization's ability to attain its goals by using resources in an effective and efficient manner (Daft, 2004).

CHAPTER TWO

LITERATURE REVIEW

This chapter presents a review of the literature related to the purpose of the study. The chapter is organized according to the specific objectives in order to ensure relevance to the research problem. The purpose of reviewing the literature is to explore research works and other relevant secondary data which are useful to the study. It also provides a basis for conceptual framework for the study, and the operationalisation of variables in order to explain the variable and how to measure it.

2.1 Theoretical Review

According to Storey *et al*., (2006), supply chain management is a developing discipline in terms of both theory and practice, and only few practitioners have been able, or even seriously aspired, to manage their supply chains in the manner prescribed by a number of modern theories. Over time studies in supply chain integration have utilised different theories from various backgrounds including: Process-Based Management Theory, Network Theory, Stakeholder Theory and Transaction Cost Theory. In addition, SCOR reference model has also been utilised in supply chain integration studies.

2.1.1 Process–Based Management Theory

According to Lambert (2008), many researchers recognize SCI as a process-based initiative. However, their emphasis on SCM and SCI initiatives are different, and they all show little understanding on how process-based management theory can be utilized to address organizational performance improvement. According to (Van Hoek (1998); Lambert *et al.*, (1998);and Lambert, 2008), most researchers regard SCI as mere technological challenge rather than a process and management challenge. In fact, Hammer (2001) asserts that although the

concept of SCI is now common knowledge among scholars, many companies have had problems in actualizing it. Hence, there is the need for further research to enhance the process-based theory as past studies on SCI are biased towards the manufacturing and service sectors in examining the influence of supplier integration, internal integration, customer integration and information integration on organizational performance. This theory was important in explaining how the implementation of supply chain integration has since remained as a theory which is viewed as a technological challenge by many companies and not much effort has been made to make SCI a reality.

2.1.2 Network Theory

The network theory also known as networks perspective is mostly concerned with the value generation through inter-organizational relations. Harland (1996) defines a network as a specific type of relation linking a defined set of persons, objects or events. McNichols and Brennan (2006) observe that network theory focuses on both dyadic relationships and multi-party relationships. This theory was first developed in the 1970s and the 1980s with the focus on relationships between two entities, or strategic alliances, towards an approach which entails multiple relationships between different counters throughout the supply chain (Wellenbrock, 2013). According to Chang, Chiang and Pai, (2012) supply chain network is a complicated network model and its specific context depends on the relationships among the network members (Hakansson & Ford, 2002). Peck, (2005) and Zhao, Anand and Mitchell (2005) affirm that networks perspective has been employed in studying both global supply chains and local specific industries supply chains. But little is known on how networks perspective can provide understanding of organizational performance. This theory was useful in explaining the relationship between the different supply networks in the health supply chain and how they are linked for efficient and effective organization performance.

2.1.3 Stakeholder Theory

Friedman and Miles (2006) state that an organization is a grouping of stakeholders, and is designed to manage their interests, needs and viewpoints. Research on stakeholder theory has majored on defining stakeholders and identifying who are the stakeholders (Tate, Ellram & Brown, 2009). Typically stakeholders comprise customers, employees, local communities, suppliers and distributors (Friedman, 2006). The stakeholder theory is premised on the fact that in contemporary business environment, individual businesses do not only compete as autonomous entities, but they also face competition from organizational supply chains (Drucker, 1998). Thus defining and identifying the key stakeholders associated with the business processes becomes increasingly complex.

The stakeholder theory was used in this study to establish how different stakeholders in the health supply chain including departments of procurement, planning, drug regulatory board, human resources, and health programs of the ministries of health; central medical stores; donors; nongovernmental organizations (NGOs); regions and districts; health facilities; teams of community health workers; and private sector partners, such as third-party logistics providers, drug manufacturers, distributors, and private service providers influence the integration and how it affects the organizational performance.

2.1.4 Transaction Cost Theory

Use of information technology in SCI has facilitated the reduction of coordination costs (Bakker *et al.*, 2008). It is now a fact that the use of IT in electronic market places reduces the cost of searching information about product offerings and prices. Similarly, collaboration through information sharing can lower transaction costs, reduce supply chain uncertainties, and ease the

cost of contracting. Arrowsmith (2002) observes that when a supplier is unable to accurately predict the price of his product inputs, he will be reluctant to enter into a contract, which locks him into a fixed price for an extended period of time. The manufacturing sector supply chains have historically experienced uncertainty out of uncertainties in supply, demand, new product development, and technology (Koufteros, 1999).

The transaction cost theory clarifies our understanding of how firms are linked together through supply chain integration. In explaining supply chain integration, the theory suggests that components of both internal and external integration are included. The application of the transaction cost theory provided a theoretical grounding to the developed theoretical framework across its levels of external supplier, external customer and internal company integration (Stank et al., 2001). In the context of this study, uncertainties in the health supply chain affects the stakeholders. The transaction cost theory was used to establish how information technology can be used to reduce transaction costs in the supply chain.

2.1.5 SCOR Model

The Supply Chain Council's Supply Chain Operations Reference (SCOR) model lays a lot of emphasis on integration. SCOR is a management tool that allows users to address, improve, and communicate supply chain management practices within and between different parties (Supply Chain Council, 2001). According to Stewart (1997) the tool is a cross industry framework for the evaluation and improvement of supply chain management and performance. It is a process reference model for supply chain management, spanning from the supplier's supplier to the customer's customer (Supply Chain Council, 2001). It comprises five major supply chain processes: plan, source, make, deliver and return. The source process of the model entails

managing incoming raw materials, supplier selection and certification, supplier relationships and agreements (Stephens, 2001; Stewart, 1997).

The delivery process of the model is concerned with aspects of warehousing, distribution and logistics, and decisions that influence delivery of products to customers, including customer order entry and management, warehouse picking and distribution, invoicing and recruitment of carriers.

The SCOR model is important in explaining the issue of supply chain integration. It provides a holistic view of supply chain integration from an empirical survey research methodology perspective. The SCOR model reveals the quantitative relationships among its five components. Richey *et al*., (2010) suggested that the supply chain governance which balances the self-interest and interdependency in supply chains can help improve performance. Using the Source and Deliver components of the SCOR model, this study enhances the understanding of the importance of working with suppliers and customers in supply chain management.

2.2 Conceptual Framework

A conceptual framework is a scheme of concepts or variables which the research operationalizes in order to achieve set objectives (Chakraborty, 2009). It is a virtual or written product, which explains through graphics or narration, the items to be studied, that is, the key factors, concepts, and variables and the presumed relationships between them. It is used to explain how the independent variables affect the dependent variable. In this case the independent variables are the elements supply chain integration whereas the dependent variable is organizational performance.

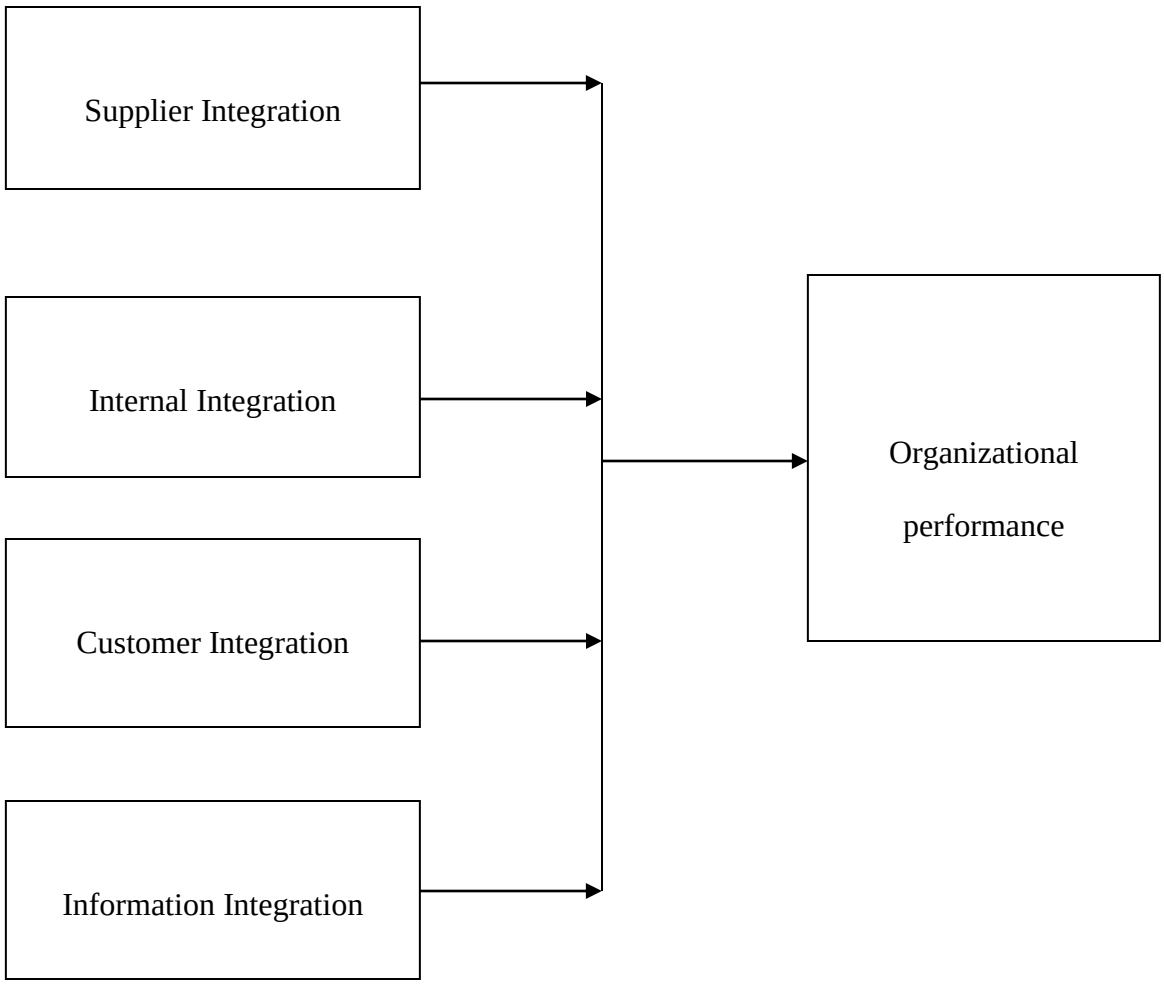


Figure 2.1: Conceptual Framework

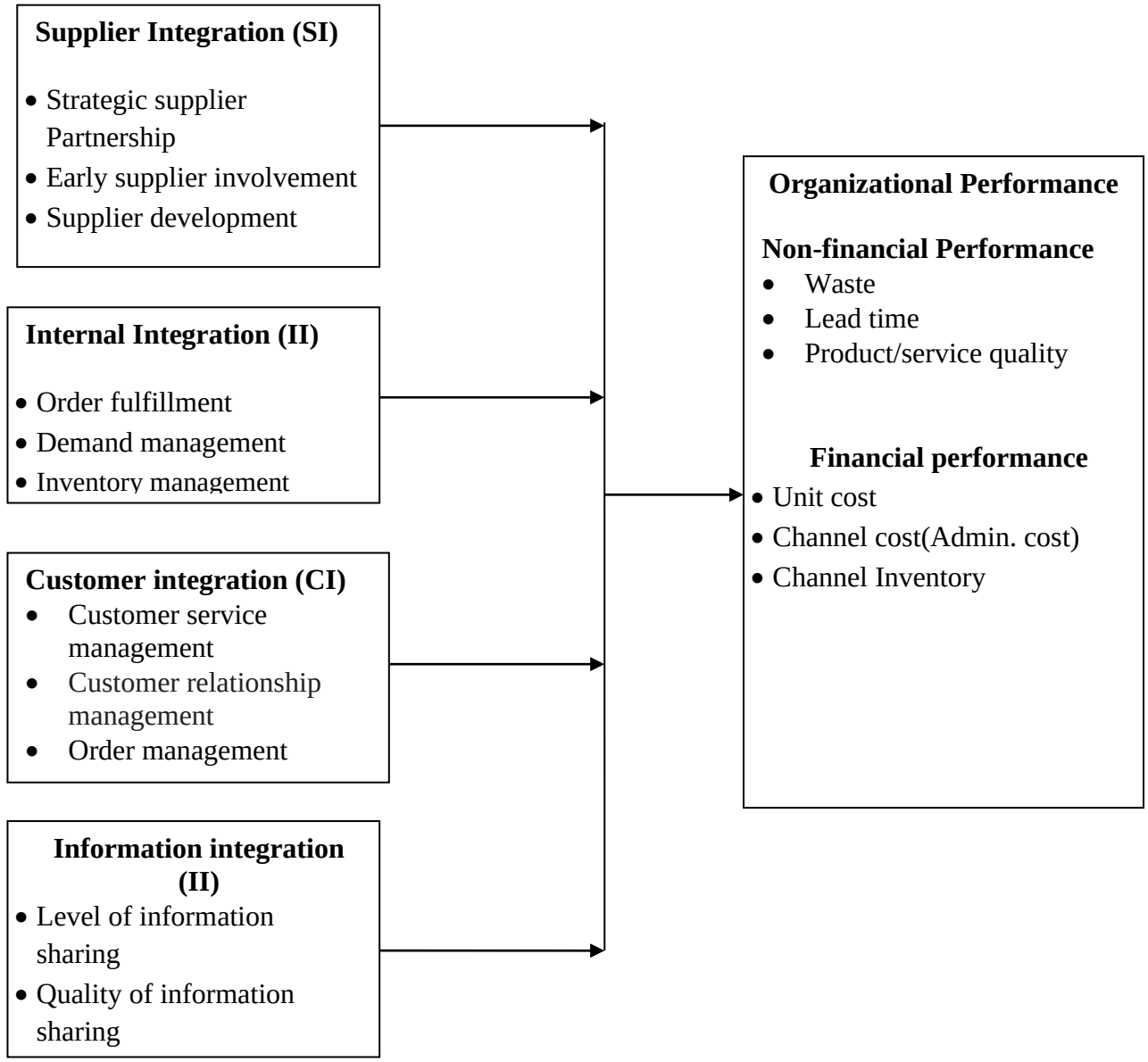


Figure 2.2: Operational Framework

2.2.1 Supplier Integration

Supplier integration is said to take place when firms partner with suppliers to structure their inter-organizational practices, procedures, strategies and behaviors into a synchronized and manageable process so as to serve their customers profitably (Flynn *et al.* 2010). Different firms have engaged in strategic supplier partnership (SSP) to deliver supplier integration objectives with much benefits as SSP is designed to leverage the strategic and operational capabilities of individual participating organizations. SSP is defined as the long term relationship between an organization and its suppliers (Hosseini, Azizi & Sheikhi, 2012). According to Kiplagat & Kiarie (2015) SSP emphasizes direct, long-term association while encouraging mutual planning and problem solving efforts. Parties enter into strategic partnerships to promote mutual benefits and ongoing participation in key strategic areas like technology, products, and markets. Strategic partnerships with suppliers allow organizations to work more effectively with selected suppliers willing to share responsibility for the success of their products (Koufteros, Cheng & Lai, 2007).

Early supplier involvement (ESI) is another approach that can be used to deliver supplier integration objectives. Suppliers who enter into partnership during product-design process can suggest more cost effective design choices, and help in selecting the best components and technologies, and design assessment (Koufteros, Cheng & Lai, 2007). Finally, the supplier development programs is yet another approach that can be used to deliver supplier integration objectives in a supply chain. Strategically aligned organizations can work closely together to develop their competencies (Lee, Kwon & Severance, 2007; Msimangira, 2010).

2.2.2 Internal Integration

Internal integration refers to the degree to which a manufacturer structures its own organizational strategies, processes and practices into collaborative synchronized processes in order to meet customer's requirement at the lowest cost (Zhao *et al*., 2008; Flynn *et al*., 2010). Fawcett and Magnan (2002) have defined internal supply chain integration as the degree of coordination between the internal functions of all the trading partners in the supply chain. According to the duo internal integration emphasizes the importance of different departments in the organization acting as an integrated process rather than as functional silos.

The constructs of internal integration include: order fulfillment, demand management and inventory management (Koufteros, Vonderembse & Jayaram, 2005). Order fulfillment is one of supply chain activities in an organization that involves the supplier meeting the demands of a customer. It denotes the ability of the supplier to meet the requirements of the customer (Zhao, Huo, Selen & Yeung, 2011). However, Lambert (2008) asserts that order fulfillment in the supply chain process "involves more than just filling orders, as it encompasses all activities necessary to define customer requirements, design a network, and enable a firm to meet customer requests while minimizing the total delivered cost." Order fulfillment processes vary according to the type of organizations (Dilworth, 2009).

The capability of a supplier in meeting the order requirement of a customer has an impact on the level of customer service. According to Lambert (2008), demand management is "the process that balances customer requirements with supply chain capabilities". With the right process in place, management can proactively match supply with demand and execute the plan with minimal disruptions.

2.2.3 Customer Integration

Customer integration refers to the degree to which a firm collaborates with its customers to improve visibility and enable joint planning (Wong *et al.,* 2011). Customer integration provides organizations to better understand market expectations and opportunities and helps them become more responsive to customer needs and requirements (Swink *et al.,* 2007). Customer integration comprises three sub variables: customer service management, customer relationship management, and customer order management. Customer service management encompasses the entire array of practices that are employed to manage customer complaints, build long-term relationships with customers, and improve customer satisfaction. Customer relationship management is an important component of SCM practices. According to Day (2000) committed relationships are the most sustainable advantage for firms because of their inherent barriers to competition. The growth of mass customization and personalized service is leading to an era in which relationship management with customers is becoming crucial for corporate survival. Good relationships with supply chain members, including customers, are necessary for successful implementation of SCM programs.

2.2.4 Information Integration

Information integration is recognized in research as an important dimension of supply chain integration (Zhao *et al.*, 2008., Flynn *et al*., 2010). According to Flynn *et al*., (2010) information is the glue that holds organizations together and can be used to integrate process activities within a single process and across multiple processes. The concept is also closely related to the sharing of information and knowledge across the supply chain particularly that of demand, forecasting and replenishment (Lee, 2000), and is recognized as a central component in integration of

planning and control. But given that information integration involves backward coordination of information technologies and the flow of data from customers to suppliers, it differs from the integration of physical products which involves forward integration.

Information sharing can be quantitative and qualitative and both aspects are important for the practices of SCM and have been treated as independent constructs in past SCM studies. Level (quantity aspect) of information sharing refers to the extent to which critical and proprietary information is communicated to one's supply chain partner. The nature of shared information can vary from strategic to tactical and from logistics activities to general market and customer information (Menzter, 2000). Childhouse and Towill (2003) affirm that simplified material flow, including streamlining and making all information flow throughout the chain highly visible, is the key to an integrated and effective supply chain.

On the other hand, quality of information sharing pertains to the accuracy, timeliness, adequacy, and credibility of information exchanged. However, while information sharing is important, the significance of its impact on SCM depends on what information is shared, when and how, and with whom. Divergent interests and opportunistic behavior of supply chain partners, and informational asymmetries across supply chain affect the quality of information. It appears that there is a built in reluctance within organizations to give away more than minimal information since information disclosure is perceived as a loss of power. Given these predispositions, ensuring the quality of the shared information becomes a critical aspect of effective SCM. Organizations need to view their information as a strategic asset and ensure that it flows with minimum delay and without distortion (Li et.al, 2006).

2.2.5 Organizational Performance Measurement

Organizational performance refers to how well an organization achieves its market-oriented goals as well as its financial goals whereas performance measurement is quantifying, either quantitatively or qualitatively, the input, output or level of activity of an event or process (Kaplan & Norton, 2005). Research on performance measurement has evolved from the time when it purely focused on financial indicators to the present where both financial and non-financial indicators are appreciated by both the practitioners and the academicians (Kaplan & Norton, 2005). Researchers have used financial metrics as a tool for comparing organizations and evaluating organizations' behavior over time. Researchers are now in agreement that any organizational initiative, including supply chain management, should ultimately lead to enhanced organizational performance.

This research adopts three types of performance measures: Non financial performance (business processes performance and customer performance) and financial performance (Bozarth, 2009). Business process performance sub-constructs include: waste reduction, time compression, flexible responses, and unit cost reduction. Customer performance attributes include: improved product/service quality, improved timeliness, and improved flexibility (Lee, Kwon & Severance, 2007). Financial performance attributes include: profit margins, increased cash flows, channel cost reduction, and reduced channel inventory.

2.3 Empirical Review

This section presents the empirical review of previous studies relevant to this one. The review revolves around each study variable as postulated from the theories and conceptualized on its own rationale.

2.3.1 Supplier Integration and Organizational Performance

Lambert (2004) established that successful supply chain management needs cross-functional integration of key business processes within the firm and across the network of companies that form part of the firm's supply chain. He observes that through integration with suppliers, manufacturing firms are able to share order and inventory information with suppliers and cross-functional integration of key business processes helps suppliers prepare high-quality materials and services on time.

Frohlich and Westbrook (2001) investigated supplier and customer integration and identified five different SCI strategies, characterized as various "arc(s) of integration", with a high degree of "arc" representing high levels of both supplier and customer integration. Their findings indicated that companies with the widest degree of arc for supplier and customer integration achieved the highest level of operational performance. Their research findings were collaborated by a follow up study by Frohlich (2002) which established that the operational performance of manufacturers that relied on high-level integration outperformed that of manufacturers who relied on low-level integration, in such metrics like delivery time, transaction costs, and inventory turnover.

Lee (2007) found out that supplier integration, including communication, sharing of information regarding inventory data and production scheduling, and working together with suppliers can reduce upstream complexity which negatively affects schedule attainment. The work by Bozarth *et al.*, (2009) collaborated these findings by establishing that working together with suppliers especially on matters pertaining to sharing information about production plans and demand forecasts can reduce the bullwhip effect, which is highly related to schedule attainment.

Zhao *et al.*, (2008) carried out a research from transaction cost theory perspective and found out that supplier integration can reduce transaction costs. Whenever visions and cooperative goals are shared in supplier integration, opportunistic behaviors are greatly reduced. The research was collaborated by Flynn *et al.*, (2010) who found out that supplier integration can reduce transaction costs by reducing uncertainties. For instance, environment uncertainties are greatly reduced by investing in specific assets such as information systems and dedicated people, to facilitate information sharing and joint working.

Frizelle and Efstathiou (2003) found out that supplier integration plays an important role in reducing production costs. On one hand, higher-level supplier integration entails fewer suppliers which in general lead to economies of scale, whose net effect is reducing the material and product costs. On the other hand, with the trust and cooperation from suppliers, manufacturers are willing to invest in fixed assets and R&D activities to improve their suppliers' product and process quality to reduce production costs.

Numerous empirical studies (Shin *et al.*, 2000; Frohlich and Westbrook 2001; Frohlich, 2002; Sanders and Premus, 2005; Devaraj*et al.*, 2007) have established that supplier integration helps manufacturers in reducing inventory and improving delivery speed, quality, and customer service whenever they share information and work with suppliers. Though empirical studies on the direct relationship between supplier integration and customer satisfaction are somewhat rare, some studies indicate the existence of indirect effects. The study by Swink *et al.*, (2007), for instance, found that strategic supplier integration, when mediated by manufacturing competitive capabilities, is positively associated with customer satisfaction. Again, Frohlich and Westbrook (2001) and Vickery *et al.*, (2003) found out that firms with higher levels of SCI achieve better customer service. Whenever there is high-level supplier integration, manufacturers usually become satisfied with materials or services provided by suppliers. This research investigated how supplier integration leads to customer satisfaction.

2.3.2 Internal Integration and Organizational Performance

Internal integration emphasizes the coordination among internal functions and firm-wide standards and norms (Germain and Iyer, 2006). It is very helpful in attaining product scheduling. Through cross-functional coordination and working together, production planning and scheduling, customer order management, and demand planning are facilitated to meet the requirement of schedules (Rosenzweig *et al.*, 2003). Firms are able to allocate available resources at suitable schedule costs because information on customer orders, inventory level, and purchasing and production schedule are effectively communicated among functions. In turn, good communication among functions quickly delivers demand information, thus reducing the "bullwhip effect" (Lee *et al.*, 1997), and schedule modifications.

A large body of empirical research has highlighted the benefits of internal integration in improving competitive performance (Swink *et al.,* 2007). Rosenzweig *et al.,* (2003) demonstrated a positive direct relationship between internal and external integration intensity. Using data from 244 manufacturing firms in the US, Koufteros *et al.,* (2005) found that internal integration positively influences product innovation and quality. Swink *et al., (*2007) established that internal product process technology integration improves manufacturing capabilities in terms of quality, delivery, process, and new product flexibility.

Rosenzweig *et al.,* (2003) are of the view that internal integration, can help create and transfer knowledge effectively. With such arrangements experts from different functions work together as a team to meet customers' demands for new product development or product quality improvements. Internal integration, in addition includes the application of enterprise software systems like SAP, production planning and scheduling, and other integrated software platforms (Stratman & Roth, 2002; Sanders & Premus, 2005; Germain & Iyer, 2006). Similarly, information system research notably by Ahmad and Schroeder, (2001) and Hendricks *et al.*, (2007) has demonstrated that manufacturers that have adopted enterprise resource planning or other integrated software platforms have posted better operational performance than those that failed to do so, thereby supporting the positive effects of internal integration on operational performance.

Internal integration can also improve customer satisfaction in many aspects. First, internal integration, via information transfer from marketing/sales departments to other departments, makes it easy for the whole company to understand customer requirements. Furthermore, integrated customer order fulfillment processes, are more rapid where all activities, functions,

and departments involved in fulfilling the order are integrated, and can customer satisfaction is attained when production time is shortened, development costs are reduced, and delivery speed is increased. For instance, when a firm wants to introduce a new product, the marketing department must first present the needs of the customer in order to formulate the new product, followed by interactions between experts from the R&D, marketing, and production departments to develop product designs in fulfillment of the requirements of the customer (Yang, 2007).

Previous empirical research has also highlighted the benefit of internal integration on customer satisfaction (Stank *et al.*, 2001; Vickery *et al.*, 2003; Swink *et al.*, 2007). Using data from 57 first-tier automotive suppliers to the Big Three automobile manufacturers in North America, Vickery *et al.*, (2003) found a direct relationship between SCI (including cross functional team integration) and customer service. Swink *et al.*, (2007) also found that internal product-process technology integration improves manufacturing capabilities, which in turn improves customer satisfaction.

2.3.3 Customer Integration and Organizational Performance

Strategic integration with customers highlights frequent customer interactions, during which firms discover customer preference and improve demand forecasts (Swink, 2007). When manufacturers work with their customers, they improve on production schedules and reduce frequent schedule modifications. They also reduce bullwhip effects through effective information sharing and cooperation between them. Furthermore, communication of order information and capacity makes it easier for manufacturers to adjust their production scheduling and capacity in advance (Lee *et al.*, 2007).

Similarly, previous empirical research has shown that customer integration can lead to competitive benefits (Koufteros *et al.*, 2005; Germain & Iyer, 2006; Swink, 2007). Kulp (2004) demonstrated that there exists a positive association between manufacturers' performance and the act of a manufacturer sharing either inventory levels or customer requirement information with retailers. Again, Koufteros *et al.,* (2005), in a survey of new product development in 244 manufacturing firms in the US, demonstrated that customer integration directly influences competitive capabilities in terms of product innovation and quality performance. Also, Germain and Iyer (2006) found that downstream integration with customers positively influenced logistical performance.

Swink *et al.*, (2007) also confirmed that strategic customer integration is positively associated with competitive capabilities in manufacturing. Close interactions between customers and manufacturers offer opportunities for both to develop mutual forbearance and improve information accuracy. Swink *et al.*, (2007) established that more accurate information about customer demand and preferences, as well as frequent information updates, can speed up product design, improve production planning, and reduce inventory obsolescence. Customer integration also generates remarkable opportunities to leverage the intelligence embedded in the collaborative processes, enabling businesses to reduce costs, create more value for customers, and quickly detect critical demand changes to design and execute optimal responses Swink *et al.*, (2007).

Moreover, customer integration helps manufacturers enhance the understanding of customer preferences (Swink *et al.*, 2007), which makes manufacturers more responsive to customer needs. Close customer integration makes it easier for manufacturers to effectively and efficiently

meet customers' requirements. By surveying customer needs, involving customers in product design, and receiving feedback on product quality and performance, manufacturers respond by providing high-quality and low-priced products to their customers thereby meeting their satisfaction.

2.3.4 Information Integration and Organizational Performance

In supply chain, the act of coordinating activities is important. This is more emphasized in information management, information management systems and the data transaction in the chain. Research has already established that coordinated and appropriate information between partners has positive impact on speed, accuracy, quality and other aspects of a firm. Information integration is the extent that operational, tactical and strategic information are transferred between business partners and the central company (Elahi *et al.,* 2009). Frohlich and Westbrook, (2001) observe that downward flow of material in supply chain should be supported through information flows from bottom to top.

Kalakota and Robinson (2010) suggested that significant progress in supply chain management can be achieved through the integration of business processes and information flow between business partners. Lai *et al.,* (2007) defined information integration as using information and communication technology in order to coordinate decisions and activities between an organization and its partner. Jayaram and Tan (2010) concluded that information integration has positive relationship with organizational performance of an organization. Information integration in this study is reviewed through two dimensions of information technology (technical) and information sharing (social dimension). More importantly, placing emphasis on information technology without the willingness to share critical information will not significantly associate organizations together.

2.4 Critique of Literature

Langat (2013) examined the influence of inbound logistics management on procurement performance at Kenya Medical Supplies Authority. His research findings showed that inbound logistics had a significant and positive impact on procurement performance at KEMSA. However, Langat's work did not examine the relationship between SCI and organizational performance.

Using KEMSA as case study, Kiplagat and Kiarie (2015) explored the effect of supplier management practices on organizational performance among state corporations in Kenya. The study revealed that organizational performance was significantly influenced by supplier relationship management practices. This research however failed to show the link between supply chain integration and organizational performance.

Another research by Wafula (2015) that sought to assess the effects of pharmaceutical regulation on procurement organizational performance found out that pharmaceutical regulations have a significant and positive effect on KEMSA's procurement performance. However, the research was merely exploratory and did not establish any link between supply chain integration and organizational performance. Similarly, another study by Amemba (2013) which examined the effect of implementing risk management strategies on organizational performance using KEMSA as case study revealed that risks management strategies have a significant effect on organizational performance at KEMSA. However, the study did not examine the relationship between supply chain integration and organizational performance.

Again, the results of the work by Frizelle and Efstathiou (2003) established that supplier integration is significant in reducing production costs. The duo established that a deepened

supplier integration calls for fewer supplier participation leading to economies of scale, and hence a reduction in material and product costs. However, Frizelle *et al.,* (2002) study was carried out in a manufacturing set up and their findings may not apply in a public sector distribution chain.

Koufteros *et al.,* (2005) used data from 244 US manufacturing firms to assess whether internal integration influences product quality. Though their findings were positive, they fall into the same pattern like those obtained by Frizelle and Efstathiou's study, and may not be applicable in the public sector which is contextually different from manufacturing organizations which are mainly privately owned. Finally, Nathalie and Marianne (2008) reviewed supply chain integration and performance publications and concluded that supply chain integration does not always improve performance.

2.5 Research Gaps

From the above discussions, it is evident that existing literature on supply chain integration is largely driven by the typical view that a greater level of integration leads to better firm performance. However, past research has been set up in the private sector (Cannon *et al.,* 2010; Rosenzweig, 2009), which differ from the public sector (Zhao *et al.*, 2007), and hence the results may not apply in the context of public health supply chains.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter outlines the philosophical foundation that underpins the approach that was taken in this research. It presents the research design, the target population, the employed sampling technique, the sample and the sample size, data collection methods, pilot study, reliability and validity of the research instrument, and finally data analysis.

3.1 Research Design

A research design is a blue print for the collection, measurements and analysis of data to achieve the fore stated objective (Cooper & Schindler, 2011). In addition Sekaran and Bougie (2009) define research design as a master plan that specifies the method and procedures for collecting and analyzing the required information. The study adopted a cross-sectional research design. A cross-sectional research design is a data gathering and analysis approach in which respondents answer questions or respond to statements that are developed in advance at a point in time (Kasunic, 2005). According to Cooper and Schindler (2006), cross sectional studies are carried to establish whether significant associations among variables exist at some point in time (Nachmias & Nachmias, 2008).

3.2 Target Population

According to Agarwal (2009), target population is a large collection of individuals or objects with similar characteristics and constitutes the main focus of any scientific inquiry. Gall & Borg (2007) identify two types of population: target and accessible population. Mugenda and Mugenda (2003) define target population to constitute all members of a real or hypothetical set of people, events or objects from which a researcher wishes to generalize the results of their

research; and accessible population as the set of all the individuals who realistically can be included in the sample. For purposes of this study, the target population constituted of one hundred and twenty three (123) KEMSA staff working at the head office in four major divisions.

Table 3.1 Target Population

Department(Divisions)	No of people
Business development division	22
Operations division	33
Finance & Administration	37
Procurement division	31
Total	**123**

Source: Primary data

3.3 Sampling Procedure

The study used stratified random sampling procedure. The choice of the technique is based on the fact the staff in the head office are classified into four divisions namely; Business development division, Operations division, Finance & Administration and Procurement division (KEMSA, 2017). These divisions perform different activities in the supply chain and inter-phase uniquely with supply chain integration. Stratified sampling divides a heterogeneous population into a number of distinct categories or strata of independent sub population from which individual elements can be randomly selected (Trochim, 2000). The researcher used the formulae suggested by Mugenda and Mugenda (2003) to determine the sample size of the study as follows;

nf = z^2pq/e^2

Where:

nf= population

z = table value from the normal table

p = probability of success

q = (p - 1) probability of failure

e = allowed error

nf = $(1.96)^2 (0.5) (0.5)$

$(0.05)^2$

= 384

Zikmund, (2010) states that, when the population size is less than 10,000, the sample size (nf*) can be calculated as follows;

$$nf^* = \frac{nf}{1 + nf /- 1/ N}$$

=384 / (1+ (384 / 123)) = 93

Table 3.2: Sample Size Determination

Department(Divisions)	**No of people**	**Sample**	**%**
Business development division	22	22/123*93=17	18.3%
Operations Division	33	33/123*93=25	26.9%
Finance & Administration	37	37/123*93=28	30.1%
Procurement division	31	31/123*93=23	24.7%
Total	**123**	**93**	**100**

Random numbers were used to select the sample of 93 respondents. Orodho (2005) states that simple random sampling ensures that each unit has an equal probability of being chosen, it is the most representative of the entire population and least likely to result in bias. It has statistical properties that allow the researcher to make inferences about the population based on the results obtained from the sample.

3.4 Data Collection Method and Tools

The study relied on both primary and secondary data. A semi-structured questionnaire containing close ended questions was used to collect primary data. It was administered on face to face basis as well as through email. Dempsey (2003) posits that questionnaires are preferred for primary data gathering because they are not only effective data collection instruments that allow respondents to give their opinions pertaining to the research problem, but also give them freedom to express their views or opinions more objectively. Further, according to Kothari (2008) the information obtained from questionnaires is free from researcher's bias which makes them ideal for a positivist research approach.

3.5 Pilot Testing

Prior to actual data collection, a pilot test was conducted to make an assessment of the validity of the questions and the likely reliability of the data that was to be collected. According to Copper and Schindler (2011) a pilot test is conducted to detect weaknesses in the design and instrumentation and provide a proxy data for selection of probability sample. The validity of the data collection instrument for the study was tested by first administering it on randomly selected respondents of different division in the strata. The information collected during the pilot study was used to undertake a preliminary analysis to enable the research questions to be answered appropriately.

3.5.1 Reliability Test of the Instrument

Reliability is the extent to which data collection techniques or analysis procedures yields consistent findings (Mugenda & Mugenda, 2003). This means that if people answered the same question the same way on repeated occasions, then the instrument can be said to be reliable. Reliability analysis was used to test the internal consistency of the research instruments for the purposes of identifying those items in the questionnaire with low correlations in order to exclude them from further analysis. Cronbach's alpha a coefficient of reliability that gives unbiased estimate of data generalizability was used to test reliability of the answered questionnaires. According to Zinbarg (2005), Cronbach's alpha is a coefficient of reliability that gives an unbiased estimate of data generalizability.

3.5.2 Validity Test of the Instrument

Validity refers to the extent to which an instrument measures what it is supposed to measure (Cooper & Schindler, 2006). Validity estimates how accurately the data obtained in the study represents a given variable or construct (Doodley, 2003). This research tested the validity using the Cronbach's alpha. Alpha values range from zero - no internal consistency to one - complete internal consistency. Validity of the instrument was tested by administering questionnaires to randomly selected respondents of different division in the strata, to identify any ambiguous and unclear questions. Feedback received was used to fine-tune the questionnaire before embarking on the actual data collection.

3.6 Operationalisation of the Research Variables

Operationalisation of the variable, otherwise known as operationally definition of a concept, renders a variable measurable. It is done by looking at the behavioral dimensions, indicators, facets or properties denoted by the concept. These are then translated into observable and measurable elements so as to develop an index of the concept.

Table 3.3 Operationalisation of the Research Variables

Variables	Indicators	Operational Indicators
Supplier integration	Strategic supplier partnership	• The percentage of buyer -supplier relationship which can be described as collaborative
	Early Supplier Involvement	• The percentage of supplies where suppliers are engaged early in the procurement process
	Supplier development	• The percentage share of supplier development programs
Internal integration	Order fulfillment	• The percentage share of orders fulfilled in time
	Demand management	• The percentage number of orders that were delivered on time. • The Percentage number of orders which returned in the past 1 year
	Inventory management	• The number of stock-out occurrences in the past 1 year
Customer integration	Customer service Management	• The customer satisfaction index for the past financial year
	Customer relationship Management	• Percentage number of complaints resolved conclusively in the past financial year • The time period taken in solving customer complaints
Information integration	Level of information sharing	• The percentage level of information shared with suppliers • The percentage level of information shared with

		suppliers
	Quality of information sharing	• The quality of information shared with suppliers • The quality of information shared with other functional departments • The quality of information shared with customers
Organizational Performance	Non-Financial Performance	• The percentage decline in wastes in the past financial year • The percentage time reduced to meet customer's order. • Flexibility in meeting customers' orders • The percentage increase in product quality • The percentage increase in delivery timeliness • The percentage increase in flexibility
	Financial performance	• The percentage increase in cash flows • The percentage reduction in channel cost • The percentage decrease in channel inventory

3.7 Method of Data Analysis

Data analysis is the process of editing and reducing accumulated data to a manageable size, developing summaries, looking for patterns, and applying statistical techniques (Chakraborty, 2009; Mugenda & Mugenda, 2008). Normality test was conducted to test the accuracy of the results. Pearson coefficient correlation analysis was used to determine the relationship between each independent variable on the dependent variable. The study employed a multiple regression analysis to estimate the causal relationships between factors under study. The multiple regression equation of the study is shown below:

$$\mathbf{Y= \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e}$$

Where;

Y=Organizational performance

α = Constant

$\beta_1 \ldots \beta_4$ = the slope representing degree of change in independent variable by one unit variable.

X_1 = Supplier Integration

X_2= Internal Integration

X_3= Customer Integration

X_4=Information Integration and e= error term

With the aid of Statistical Package for Social Sciences (SPSS), the research performed linear and multiple regressions analysis on primary data to estimate the beta values of factors and F – test statistics to determine their significance at 95% confidence level. The results of the analyzed data were presented using tables with a brief description thereafter.

Table 3.4: Hypothesis Testing

Objective	Hypothesis	Analysis	Interpretation
Objective 1: To establish the relationship between supplier integration and organizational performance	$H_{01:}$ There is no significance relationship between Supplier integration and organizational performance	Simple regression analysis $Y= \beta_0+ \beta_1SI+e_1$ where Y=composite score of performance β_0=regression constant SI=composite score of supplier integration e_1= error term	R^2 to assess how much change in supplier integration is due to Organizational performance. F-test to assess overall robustness and significance of the simple regression mode t-test to determine significance of supplier integration
Objective 2:To determine the relationship between internal integration and organization organizational performance	$H_{02:}$ There is no significance relationship between Internal Integration and Organizational performance	Simple regression analysis $Y= \beta_0+ \beta_2II+e_2$ where Y=composite score of performance β_0=regression constant II=composite score of Internal integration e_2= error term	R^2 to assess how much change in internal integration is due to Organizational performance. F-test to assess overall robustness and significance of the simple regression mode t-test to determine significance of internal integration
Objective 3: To assess the relationship between customer integration and organization organizational performance	H_{03}: There is no significance relationship between Customer Integration and organizational performance	Simple regression analysis $Y= \beta_0+ \beta_3CI+e_3$ where Y=composite score of performance β_0=regression constant II=composite score of customer integration e_3= error term	R^2 to assess how much change in customer integration is due to Organizational performance. F-test to assess overall robustness and significance of the simple regression mode t-test to determine significance of customer integration

Objective	Hypothesis	Analysis	Interpretation
Objective 4 To establish the relationship between information integration and organization organizational performance	H_{04}: There is no significance relationship between Information integration and organizational performance	Simple regression analysis $Y= \beta 0+ \beta 4II+e4$ where Y=composite score of performance β0=regression constant II=composite score of Information integration e4= error term	R^2 to assess how much change in information integration is due to Organizational performance. F-test to assess overall robustness and significance of the simple regression mode t-test to determine significance of information integration

CHAPTER FOUR

RESEARCH FINDINGS, ANALYSIS AND DISCUSSION

This chapter presents the findings of the study and makes reference to relevant research to support the findings of the study. The chapter begins by presenting response rate, respondents' characteristics followed by results of reliability and validity testing. Additionally, the chapter provides detailed results which are presented using descriptive statistics and a variety of inferential statistics. The analyzed data is arranged under themes that reflect the research objectives.

4.1 Response Rate

Response is the percentage rate of the returned questionnaires. The targeted respondents in the study were 93 technical, middle level and top management employees at KEMSA. Seventy six (76) out of 93 respondents returned their questionnaires giving a response rate of 82%, which is an excellent response rate. The results are shown in Table 4.1. Mugenda and Mugenda (2003) consider a response rate of 50% is adequate for analysis and reporting; a rate of 60% is good and a response rate of 70% and over is excellent. Again, Dillman (2000) suggests 50% as the minimal level while Fowler (2009) suggests 60%. Similarly, Babbie (2011) asserts that return rates of 50% are acceptable for analysis and publication, 60% is good and 70% is very good. Thus, the 82% return rate for this study was considered credible enough to allow generalization of the findings to the target population.

Table 4.1: Response Rate

Response	Frequency	Percent
Returned Questionnaires	76	82 %
Unreturned Questionnaires	17	18%
Total	93	100%

The response rate was boosted by the use of drop and pick method, personal visits, and follow-up telephone calls and e–mail communication to the respondents, explaining the purpose of the study and its usefulness to the public health supply chains so as to improve the response rate significantly. This was also supplemented with a letter of introduction from the university.

4.2 Respondents' Demographic Profiles

The respondents' characteristics were analyzed in terms of academic qualification and years of experience in public procurement and supply chain management.

4.2.1 Education Level of the Respondents

The study sought to find the academic qualifications of the respondents. According to Kariuki *et al.,* (2012), an individual's level of formal education reflects cognitive abilities and qualities. High levels of formal education are associated with a high ability to process information and to discriminate between varieties of alternative. The results in Table 4.2 below show that 43.4% of the respondents had studied up to diploma level, 38.2% of the respondents had attained a bachelor's degree while 9.2% of the respondents had a master's degree holders and another 9.2 % had college certificate. The results imply that these employees have been exposed to diverse ideas that might enhance organizational performance. It can therefore be inferred that the study

targeted the right respondents with sufficient knowledge to appraise the concept of supply chain integration and organization performance.

Table 4.2 Level of Education

	Frequency	Percent	Valid Percent	Cumulative Percent
College Certificate	7	9.2	9.2	9.2
College Diploma	33	43.4	43.4	52.6
Bachelors' degree	29	38.2	38.2	90.8
Masters Degree	7	9.2	9.2	100.0
Total	76	100.0	100.0	

4.2.2 Years of Experience

The respondent's years of experience are important as it shows their level of interaction with the supply chain systems and their ability to give credible responses. Table 4.3 shows the distribution of the respondents' length of service in the workforce.

Table 4.3 Years of Experience

	Frequency	Percent	Valid Percent	Cumulative Percent
Below 1 year	17	21.0	22.4	22.4
Between 1 and 4 years	16	19.8	21.1	43.4
Between 5 and 9 years	33	40.7	43.4	86.8
Between 10 and 14 years	5	6.2	6.6	93.4
Over 15 years	5	6.2	6.6	100.0
Total	**76**	**93.8**	**100.0**	

Ngui (2014) maintains that an employee must work in an organization for over five years in order to understand the operations of the organization and be in a position to seamlessly give

information about its operations. Results in table 4.3 show that 43.4% of the respondents had an experience of between 5 and 9 years, 22.4% had an experience of less than a year, 21.1 % of the respondents had an experience of between 1 and 4 years while 6.6 % respondents had an experience of 10 to 14 years and another 6.6% respondents had an experience of over 15 years. This demonstrated that majority of the respondents had adequate work experience. It therefore can be inferred that the study targeted the right respondents with a good understanding of the influence of supply chain integration and organizational performance of public health supply chains.

4.3 Results of Pilot Study

According to Copper and Schindler (2011), a pilot test is conducted to detect weaknesses in the design and instrumentation and provide a proxy data for selection of probability sample. The advantages of conducting a pilot test include enhancing the training of field staff, review of instrument and prevention of wasteful expenditure on full blown survey whose results may not be applicable (Isaac & Michael, 1995). A pilot test was conducted to find out if the respondents could respond to the questions without difficulty. They were also asked to evaluate the questions for relevance, comprehension, meaning and clarity. The questionnaire was found to be valid save for a few minor corrections which were suggested by the respondents in the pilot study. The instrument was modified on the basis of the responses from the pilot tests.

4.3.1 Reliability Test

The reliability of an instrument refers to its ability to produce consistent and stable measurements (Creswell, 2013). Reliability can be viewed from two dimensions: reliability referring to the extent of accuracy and unreliability referring to the extent of inaccuracy (Hair *et*

al., 2010). Although the study adopted established scales from literature, it was necessary to test their internal consistency of the research instruments since majority of the measures were modified to suit the current study. Different coefficients exist which are used to test reliability of the measurement instruments. The most common reliability coefficient is the Cronbach's alpha which estimates internal consistency by determining how all items on a test relate to all other items and to the total test - internal coherence of data. The reliability is expressed as a coefficient between 0 and 1.

The higher the coefficient, the more reliable is the test. In this study, the reliability of measurement scales was assessed by computing Cronbach's Alpha coefficients. The results of reliability tests are summarized in Table 4.4. The results show that internal integration had the highest reliability score of 0.914 followed by customer Integration (CI) (0.886); Supplier Integration (0.794), Internal integration (0.764) and Organizational performance (0.775). This indicated a strong internal consistency among measures of variable items. All constructs depicted that the value of Cronbach's Alpha were above the threshold of 0.7 revealing a high degree of reliability. This is consistent with Nunnally (1978) who argued that a value of 0.70 is recommended, and therefore the measurement scale had a high level of internal consistency.

Table 4.4: Reliability Coefficient of Variables

Variables	**No. of items**	**Cronbach's Alpha Coefficient**	**Comments**
Supplier Integration (SI)	3	0.794	Reliable
Internal Integration (II)	3	0.764	Reliable

Customer Integration (CI)	5	0.886	Reliable
Internal integration (II)	5	0.914	Reliable
Performance(OP)	8	0.775	Reliable

4.3.2 Validity Test

Validity is the degree to which the results obtained from the analysis of the data actually represents the phenomenon under study (Mugenda, 2003). Face validity was carried out through relevant literature review, peer review and expert analysis, including the use of accepted methods employed in other relevant studies. To ensure content and construct validity, the preliminary questionnaire was pre-tested with a sample of respondents from managers in the four divisions of KEMSA and its surrounding areas for comprehension, logic, relevance and validation. Appropriate corrections were made to the final tool.

4.4 Descriptive Statistics of Study Variables

Descriptive statistics is meant to provide background to the study before further analysis can be carried out. This was done through presentation of means and standard deviation in form of tables.

4.4.1 Organizational Performance

In this study, organizational performance was assessed using subjective indicators. The sub-variables that were used include business process, financial and customer performance. The mean was used as the measure of central tendency and standard deviation as the measure of dispersion for this variable. Results of the distribution of mean scores and standard deviations are as presented in Table 4.5. The respondents were instructed to respond to the statements on a 5

point Likert scale and indicate the extent of their agreement with the statements: 5-Strongly agree, 4- Agree, 3-Not Sure, 2-Disagree, 1-Strongly disagree.

The first item sought to assess whether operational waste was reduced in the organization in the past financial years. A mean (M) score of 3.82 and standard deviation of 1.25was obtained implying that most respondents agreed that the organization reduced operational waste in the past financial year. The second item sought to assess whether the organization reduced customer response time. The results (M=3.80; SD=1.27) implied that majority of the respondents agreed that the organization reduced customer response time. Results on item 3 (M=4.17; SD=1.01) implied that majority of the respondents agreed that the unit cost output reduced in the past financial year. Other results: item 4 (M=1.47; SD=0.64) implied that respondents disagreed that medical channel cost was reduced in the financial year. Item 5; decreased channel inventory (M=4.03; SD=1.12), item 6; increased product quality (M=3.78; SD=1.26) and increased; improved product delivery timeliness (M= 4.17; SD=1.01) flexibility in meeting customer orders (M=3.84, SD =0.98) indicated a high degree of agreement. The findings of this study show that there was reduction in operational costs, customer response time was reduced, and there was reduction in cost per unit, decreased channel inventory and a slight increase in product quality. However there was no reduction in medical channel costs therefore the respondents disagreed with them.

Table 4.5 Organization Performances

S/ No	Statement	Mean	Std. Deviation	CV
1	We reduced operational wastes in our organization in the past year	3.82	1.25	0.33

2	We reduced time taken to meet our customer requirements in the past financial year.	3.80	1.27	0.33
3	Our cost per unit input reduced in the past financial year	4.17	1.01	0.24
4	We reduced medical channel cost in the past financial year	1.47	0.64	0.44
5	We decreased channel inventory in the past financial year	4.03	1.12	0.28
6	We increased product quality to our customers	3.78	1.26	0.33
7	We improved our delivery timeliness in the past financial year	4.17	1.01	0.24
8	We increased our flexibility in meeting customers' orders in the past financial year	3.84	0.98	0.26
	Overall mean, Std Dev and CV	**3.93**	**1.08**	**0.28**

4.4.2 Supplier Integration

The researcher sought to examine the results of supplier integration at KEMSA, the respondents were instructed to respond to the statements on a 5 point Likert scale and indicate the extent of their agreement with the statements: 5-Strongly agree, 4-Agree, 3-Not Sure, 2-Disagree, 1-Strongly disagree. A mean (M) score of 0-1.5 means that the respondent's strongly disagreed, between 1.50 to 2.50 means they disagreed, 2.50 to 3.50 means the respondents were not sure, 3.50-4.50 means they agreed, and a mean above 4.50 means the respondents strongly agreed. Based on the findings on table 4.6 supplier integration at KEMSA has led to: large collaborative relationships (M=3.84; SD=1.10); Supplier development programs (M=3.91; SD=1.54). The respondents however strongly disagreed that there was supplier development in the procurement process (M=1.41; SD 0.57)

Table 4.6 Supplier Integration

Statement	Mean	Std. Deviation	CV

Our supplier relationship is largely collaborative	3.84	1.10	0.29
We normally use early supplier involvement approach our procurement processes	1.41	0.57	0.40
We engage in supplier development programs	3.91	1.54	0.39
Overall mean, Std Dev and CV	**3.05**	**1.07**	**0.36**

4.4.3 Internal Integration

The researcher also sought to establish the internal integration level at KEMSA, the respondents were instructed to respond to the statements on a 5 point Likert scale and indicate the extent they agree with the statements that is: 5-Strongly agree, 4-Agree, 3-Not Sure, 2-Disagree, 1-Strongly disagree. From the findings on table 4.7 the respondents agreed that customers' orders were fulfilled in time (M=3.79;SD=1.17), respondents also agreed that there was reduction of orders returned by customers as well as there were less stock outs in the organization.(M =4.08;SD=1.02), (M=4.11;=1.03) respectively.

Table 4.7 Internal Integration

Statement	Mean	Std. Deviation	CV
We fulfill our customers' orders in time	3.79	1.17	0.31
We hardly had any orders returned by customer in the past 1 year	4.08	1.02	0.25
We hardly have any stock-out occurrences in our organization	4.11	1.03	0.25
Overall mean, Std Dev and CV	**3.99**	**1.07**	**0.27**

4.4.4 Customer Integration

The researcher further sought to assess the customer integration level at KEMSA, the respondents were instructed to respond to the statements on a 5 point Likert scale and indicate the extent they agree with the statements: 5-Strongly agree, 4-Agree, 3-Not Sure, 2- Disagree, 1-Strongly disagree. From the findings on table 4.8 the respondents disagreed that customers' satisfaction index had improved in the past financial year (M=1.59; SD=0.64), respondents agreed that customer complaints were resolved on time and there were less stock outs in the organization (M =3.79; SD=1.31), (M=3.79; =1.42) respectively.

Table 4.8 Customer Integration

Statement	Mean	Std. Deviation	CV
Our customer satisfaction index improved in the past financial year	1.59	0.64	0.40
We timely resolved customer complaints in the past financial year	3.79	1.31	0.35
We hardly have any stock-out occurrences in our organization	3.79	1.42	0.37
Overall mean, Std Dev and CV	**3.06**	**1.12**	**0.37**

4.4.5 Information Integration

The researcher further sought to determine the information integration level at KEMSA, the respondents were instructed to respond to the statements on a 5 point Likert scale and indicate the extent they agree with the statements that is: 5-Strongly agree, 4-Agree, 3-Not Sure, 2-Disagree, 1-Strongly disagree. From the findings on table 4.9 the respondents agreed that they share quality information internally to facilitate operation and management (M=3.99; SD=1.10), they share quality information with the suppliers. (M =3.87;SD=1.21), there is quality of information shared with other functional department (M=3.79; SD=1.26), there is quality of information shared with customers (M=4.16; SD= 1.03), and finally there is timely information shared with customers and suppliers(M=3.80; SD=1.07)

Table 4.9 Information Integration

Statement	Mean	Std. Deviation	CV
We share high quality information internally to facilitate operation and management	3.99	1.10	0.28
We share high quality level of information with suppliers.	3.87	1.21	0.31
The quality of information shared with other functional departments is high	3.79	1.26	0.33
The quality of information shared with customers	4.16	1.03	0.25
We share timely information with our customers and suppliers	3.80	1.07	0.28
Overall mean, Std Dev and CV	**3.92**	**1.12**	**0.29**

4.5 Tests of Assumptions of Regression Analysis

Normally, statistical tests rely upon certain assumptions about the variables used in the analysis. When the assumptions are not met, the results may not be trustworthy resulting into either Type I

or Type II error or over or under-estimation of significance or effect sizes. The assumptions of the regression analysis are of two kinds; those that are robust to violations and the other kind consist of assumptions that are not robust to violations.

4.5.1 Test for Normality

Regression analysis assumes that the data is normally distributed. Non-normally distributed data can distort relationship and significance tests hence statistical inference. Data that is normally distributed may lead to inaccuracy of results. This study tested normality using Shapiro-Wilk normality test and the results are as presented in Table 4.10. All the five variables had p-values of less than 0.05 for both Kolmogorov-Smirnov and Shapiro-Wilk tests and concludes that the data sets for these five variables are normally distributed. This implied that the residuals follow a normal distribution as required for a linear regression.

Table 4.10 Test for Normality

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Supplier Integration	.252	76	.000	.762	76	.000
Internal Integration	.263	76	.000	.855	76	.000
Customer Integration	.175	76	.000	.876	76	.000
Information Integration	.243	76	.000	.843	76	.000
Performance	.157	76	.000	.890	76	.000

4.5.2 Correlation Analysis for the Linear Relationship between the Study Variables

A correlation matrix was run in order to identify the existence of relationship between the variables. Pearson Product Moment Correlation coefficient was used for the correlation analysis, the (r) was used to determine the linear relationship between the variables of interest to the study, the (r^2) the coefficient of determination was equally meant to identify the goodness - of - fit. The correlation coefficient (r) yields a statistic that varies in ranges in value from -1 to 1. (Mugenda, 2003) A zero value of r indicates that there is no association between the two variables. When r = (+) 1, it indicates perfect positive correlation and when it is (–) 1, it indicates perfect negative correlation, meaning thereby that variations in independent variable explain 100% of the variations in the dependent variable. It also means that a unit change in independent variable, if there happens to be a constant change in the dependent variable in the same direction, correlation will be perfect positive (Kothari, 2004). The results of the correlation analysis revealed that there was positive correlation all the independent variables implying that an increase in the independent variables resulted in a positive overall performance. The correlation results were shown in Table 4.11.

Table 4.11 Correlation Analysis for the Linear Relationship between the Study Variables

		Performance	Supplier Integration	Internal Integration	Customer Integration	Information Integration
Performance	Pearson Correlation	1	.505**	.506**	-.238*	.165
	Sig. (2-tailed)		.000	.000	.038	.155
	N	76	76	76	76	76
Supplier Integration	Pearson Correlation	.505**	1	.323**	-.093	-.056
	Sig. (2-tailed)	.000		.004	.424	.631
	N	76	76	76	76	76
Internal Integration	Pearson Correlation	.506**	.323**	1	-.127	.066
	Sig. (2-tailed)	.000	.004		.273	.571
	N	76	76	76	76	76
Customer Integration	Pearson Correlation	.238*	.093	.127	1	.182
	Sig. (2-tailed)	.038	.424	.273		.116
	N	76	76	76	76	76
Information Integration	Pearson Correlation	.165	-.056	.066	.182	1
	Sig. (2-tailed)	.155	.631	.571	.116	
	N	76	76	76	76	76

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

4.6 Regression Analysis of the Independent Variables and Dependent Variable

4.6.1 Supplier Integration and Organization Performance

The study specifically sought to establish the effect of supplier integration on organizational performance as a dimension of supply chain integration. Ordinary least squares regression was carried out to determine this relationship. The regression model $Y= \beta_0 + \beta_1 X_1 + e$. was thus fitted from the data where X_1 represented supplier integration and Y denoted organizational performance. From Table 4.12(b), the regression model of X1 and Y was significant (F (1, 74) = 25.321, P-value= 0.000<0.05) implying that supplier integration is a valid predictor in the model. The results in table 4.12 (a) indicate value of R and R^2 as 0.505 and 0.255 respectively. The R value of 0.505 showed that there is a positive linear relationship between supplier integration and organizational performance. The R^2 value (0.255) indicated means that 25.5% of the variation in organizational performance is explained by the model $Y= \beta_0 + \beta_1 X_1 + e$.

Table 4.12 Supplier Integration and Organizational Performance

a) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.505[a]	.255	.245	.376

b) ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.574	1	3.574	25.324	.000[b]
	Residual	10.443	74	.141		
	Total	14.017	75			

c) Coefficients[a]

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.

		B	Std. Error	Beta		
1	(Constant)	3.086	.180		17.152	.000
	Supplier Integration	.211	.042	.505	5.032	.000

a. Dependent Variable: Performance

The study hypothesized H_{01}: There is no significant relationship between supplier integration and organizational performance. The results revealed that there is a positive and significant relationship between supplier integration and organizational performance. ($\beta 1$=.211, t=5.032, p-value=0.000<0.05). Therefore, the null hypothesis is rejected ($\beta 1$=.211, t=5.032, p-value 0.000< 0.05) and conclude that supplier integration (X_1) significantly influences organizational performance (Y).

The results of coefficients to the model $Y=3.086+.211X_1$ estimates were both significant at the 0.05 level of significance. The constant term implied that at zero supplier integration, supply chain performed at 3.086 measures. A unit increase in supplier integration increased the organizational performance by 0.211measures. Therefore, supplier integration is a good predictor of organizational performance.

The results support the findings of Frizelle and Efstathiou (2003) who established that supplier integration plays an important role in reducing production costs and thereby increasing firm performance. On one hand, higher-level supplier integration is usually related with fewer suppliers, which can lead to economies of scale for suppliers; this in turn reduces material and product costs. On the other hand, with trust and cooperation with suppliers, manufacturers are willing to invest in fixed assets and R&D activities to improve their suppliers' product and process quality, which reduces production costs.

Again, the results compare well with the findings of Lee (2007) who found out that supplier integration, including communication, sharing information regarding inventory data and production scheduling, and working together with suppliers, can reduce upstream complexity which negatively affects schedule attainment. His research findings are collaborated by a research done by Bozarth *et al.,* (2009) who found out that working together and sharing information about production plans and demand forecasts with their suppliers can reduce the bullwhip effect, which is highly related to schedule attainment.

Similarly, the findings are consistent with Zhao *et al.*, (2008) and Flynn *et al.*, (2010) who carried out a research from transaction cost theory perspective and found out that supplier integration can improve organizational performance through reduced transaction costs since opportunistic behaviors are greatly reduced under shared visions and cooperative goals in supplier integration. Furthermore, this study's findings are collaborated by empirical studies done by numerous scholars (Shin *et al.*, 2000; Frohlich and Westbrook, 2001; Frohlich, 2002; Sanders and Premus, 2005; Devaraj *et al.*, 2007) which established that supplier integration has a positive effect on organizational performance since it not only reduces inventory but also improves delivery speed, quality, and customer service through sharing information and working together with suppliers. However, this study's result contrast the findings of some scholars such as Swink *et al.*, (2007); Frohlich and Westbrook (2001) and Vickery *et al.*, (2003) who found that strategic supplier integration is negatively associated with organizational performance.

4.6.2 Internal Integration and Organizational Performance

To determine the relationship between internal integration and organizational performance, ordinary least squares regression was carried out. The regression model $Y= \beta_0 + \beta_2 X_2$ was thus

fitted from the data where X_2 represented internal integration and Y denoted organizational performance. Results in table 4.13(b) shows that the regression model of X_2 and Y was significant (F (1, 74) =25.503, p-value= 0.000<0.05), implying that internal integration is a valid predictor in the model. Results in table 4.13(a) reveal the value of R and R^2 was 0.506 and 0.256 respectively. The R value of 0.506 showed that there was a positive linear relationship between internal integration and organizational performance. The R^2 (0.256) value indicated that the explanatory power of the independent variable was 0.256. This means that 25.6% of the variation in organizational performance was explained by the model $Y= \beta_0 + \beta_2 X_2$.

Table 4.13 Internal Integration and Organizational Performance

a) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.506[a]	.256	.246	.375

b) ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.593	1	3.593	25.503	.000[b]
	Residual	10.424	74	.141		
	Total	14.017	75			

c) Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.184	.160		19.845	.000
	Internal Integration	.206	.041	.506	5.050	.000

The study hypothesized H_{02}: There is no significant relationship between internal integration and organizational performance. To test the relationship, the regression model fitted was $Y= \beta_0 +$

β_2X_2+e. The results of the survey revealed that there was positive relationship between internal integration and organizational performance (β_2=0.206, t= .141, p-value 0.000<0.05). The null hypothesis (H02): There is no significant relationship between Internal Integration and organizational performance is therefore rejected (β2=0.206, t= .141, p-value= 0.000<0.05) and conclude that Internal Integration (X_2) significantly influences organizational performance (Y). The Model equation is: Y= 3.184+ 0.206X_2. The results of coefficients to the model Y= 3.184 + 0.206X_2 estimates were both significant at the 0.05 level of significance. The constant term implied that at zero internal integration, organizational performance is at 3.184 measures, increasing internal integration by one unit increased organizational performance by 0.206 measures.

The results are in tandem with that of Rosenzweig *et al.,* (2003) who established a positive direct relationship between internal and organizational performance. Similarly, this study's results collaborates the findings of Koufteros *et al.,* (2005) who established that internal integration positively influences organizational performance. Again, the results support the findings of Swink *et al.,* (2007) who established that internal product process technology integration improves manufacturing capabilities in terms of quality, delivery, process, and new product flexibility.

With the help of internal integration, knowledge can be created and transferred effectively (Rosenzweig *et al.*, 2003). Experts from different functions work together as a team to meet the requirements of customers, especially for new product development and improvements in product quality. In addition, internal integration usually includes the application of enterprise software systems, such as SAP, production planning and scheduling, and other integrated software platforms (Stratman & Roth, 2002; Sanders & Premus, 2005; Germain & Iyer, 2006). Some extant information system research has demonstrated that enterprise resource planning or other integrated software platforms adopters have better operational performance than non-adopters (Ahmad and Schroeder, 2001; Hendricks *et al.*, 2007), supporting the positive effects of internal integration on operational performance.

On the other hand, internal integration can improve customer satisfaction in many aspects. First, with internal integration, customer requirements are well understood by the whole company via information transfer from marketing/sales departments to other departments. Furthermore, integrated customer order fulfillment processes, in which all activities, functions, and departments involved in fulfilling the order are integrated, can shorten production time, reduce development costs, and increase the speed to market, which in turn improves customer satisfaction. For example, when a firm wants to introduce a new product, the marketing department must first state the customers' needs to determine the product that is to be introduced, and expertise from the R&D department interacts with marketing and manufacturing departments to develop the product design to fulfill the customers 'requirements (Swink *et al.*, 2007)

Previous empirical research has also highlighted the benefit of internal integration on customer satisfaction (Stank *et al.*, 2001; Vickery *et al.*, 2003; Swink *et al.*, 2007). Using data from 57 first-tier automotive suppliers to the Big Three automobile manufacturers in North America, Vickery *et al*, (2003) found a direct relationship between SCI (including cross functional team integration) and customer service. Swink *et al.*, (2007) also found that internal product-process technology integration improves manufacturing capabilities, which in turn improves customer satisfaction.

4.6.3 Customer Integration and Organizational Performance

To determine the relationship between customer integration and organizational performance, ordinary least squares regression was carried out. The regression model $Y= \beta_0 + \beta_3 X_3 + e$ was thus fitted from the data where X_3 represented customer integration and Y denoted organizational performance. Results in table 4.14(b) shows that the regression model of X_3 and Y was significant ($F(1, 74) = 4.441$, p-value $=0.038<0.05$), implying that customer integration is a valid predictor in the model. In Table 4.14(a), the value of R and R^2 were 0.238 and 0.057 respectively. The R value of 0.238 showed that there was a positive linear relationship between customer integration and organizational performance. The R^2 value indicated that the explanatory power of the independent variable (customer integration) was 0.057. This means that 5.7% of the variation in organizational performance is explained by the model $Y= \beta_0 + \beta_3 X_3 + e$.

Table 4.14: Customer Integration and Organizational Performance

a) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.238[a]	.057	.044	.423

a. Predictors: (Constant), Customer Integration

b) ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.794	1	.794	4.441	.038[b]
	Residual	13.223	74	.179		
	Total	14.017	75			

c) Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	4.362	.195		22.398	.000
	Customer Integration	.106	.050	.238	2.107	.038

a. Dependent Variable: Performance

b. Predictors: (Constant), Customer Integration

The study hypothesized H_{03}: There is no significant relationship between customer integration and organizational performance. The results of the revealed that there is a positive and statistically significant relationship between customer integration and organizational performance (β_3=0.106, t= 2.107, p-value =0.038). The null hypothesis (H_{03}) is therefore rejected (β_3=0.106, t= 2.107, p-value =0.038) and conclude that customer integration (X_3) significantly influences organizational performance (Y). The Model equation is: Y= 4.362 + 0.106X_3. The constant term implied that at zero customer integration, organizational

performance was at 4.362 measures. Increasing Customer Integration by one unit increased Organizational performance by 0.106 measures.

Strategic integration with customers highlights frequent customer interactions during which firms discover customer preference and improve demand forecasts (Swink, 2007). When manufacturers work together with customers, their production schedules can be more accurate and it can reduce frequent schedule modifications. Bullwhip effects can be also reduced through effective information sharing and cooperation between manufacturers and customers. Furthermore, the communication of order information and capacity makes it easier for manufacturers to adjust their production scheduling and capacity in advance (Lee *et al.,* 2007).

Previous empirical research has shown that customer integration can lead to competitive benefits (Koufteros *et al.,* 2005; Germain and Iyer, 2006; Swink, 2007). Kulp, (2004) revealed that the act of manufacturers sharing either inventory levels or customer requirement information with retailers is positively associated with manufacturers' performance. In a survey of new product development in 244 manufacturing firms in USA, Koufteros *et al.,* (2005) demonstrated that customer integration influences competitive capabilities in terms of product innovation and quality performance directly. Germain and Iyer (2006) found that downstream integration with customers positively influenced logistical performance.

Swink *et al.,* (2007) also confirmed that strategic customer integration is positively associated with manufacturing competitive capabilities. Close interactions between customers and manufacturers offer opportunities for them to develop mutual forbearance and improve

information accuracy. More accurate information about customer demand and customer preferences, as well as frequent updating of information, can speed up product design, improve production planning, and reduce inventory obsolescence. Customer integration also generates remarkable opportunities to leverage the intelligence embedded in the collaborative processes, enabling businesses to reduce costs, create more value for customers, and quickly detect critical demand changes to design and execute optimal responses.

Moreover, customer integration helps manufacturers enhance the understanding of customer preferences (Swink *et al.*, 2007), which can make manufacturers more responsive to their customers' needs. Close customer integration makes it easier for manufacturers to meet customers' requirements effectively and efficiently. By surveying customer needs, involving customers in product design, and receiving feedback on product quality and performance, manufacturers provide high-quality and low-price products to customers with great responsiveness, which in turn leads to customer satisfaction.

4.6.4 Information Integration and Organizational Performance

To determine the relationship between Information integration and organizational performance, ordinary least squares regression was carried out. The regression model $Y= \beta_0 + \beta_4 X_4$ was thus fitted from the data where X_4 represented information integration and Y denoted organizational performance. Results in table 4.15 shows that the regression model of X_4 and Y was statistically insignificant (F (1, 74) t= 2.066, p-value= 0.155>0.05), implying that Information integration is not a valid predictor in the model. The null hypothesis (H_{04}): There is no significant relationship between information integration and organizational performance therefore accepted and we conclude that Information Integration (X_4) has insignificant influence on organizational performance (Y).

Table 4.15: Information Integration and Organizational Performance

a) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.165[a]	.027	.014	.429

b) ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.381	1	.381	2.066	.155[b]
	Residual	13.636	74	.184		
	Total	14.017	75			

c) Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.718	.179		20.787	.000
	Information Integration	.071	.049	.165	1.437	.155

a. Dependent Variable: Performance

b. Predictors: (Constant), Information Integration

The results are consistent with the findings of Lee (2007) who found out that supplier integration, including communication, sharing information regarding inventory data and production scheduling, and working together with suppliers, can reduce upstream complexity which negatively affects schedule attainment. similarly, this research findings are collaborated by a research done by Bozarth *et al.,* (2009) who found out that working together and sharing information about production plans and demand forecasts with their suppliers can reduce the bullwhip effect, which is highly related to schedule attainment. Kalakota and Robinson (2010) suggested that significant progress in supply chain management can be achieved through the

integration of business processes and information flow between business partners. Lai *et al.*, (2007) defined information integration as using information and communication technology in order to coordinate decisions and activities between an organization and its partner. Jayaram and Tan (2010) concluded that information integration has positive relationship with organizational performance of an organization. Information integration in this study is reviewed through two dimensions of information technology (technical) and information sharing (social dimension). Importantly, to emphasis on information technology without the willingness to share critical information will not significantly associate organizations together.

4.6.5 Overall Regression Analysis

A regression analysis was run in order to assess the influence of the joint relationship between supply chain integration dimensions and Organizational Performance. The study used multiple regression analysis to establish the joint effects of the study variables; supplier integration(X_1), internal integration(X_2), Customer integration (X_3) and Information Integration(X_4) aggregated together as supply chain integration (SCI) and regressed on the dependent variable, Organization Performance (Y). To test the hypothesis the following model was fitted:

Model 1: $Y= \beta_0 + \beta_1X_1+ \beta_2X_2+ \beta_3X_3+ \beta_4X_4+ e$

Results in Table 4.16(b) show that the regression model was significant (F (4, 71) = 14.432, p-value0.000<0.05) implying that SCI dimensions were a valid predictor of organizational performance. The value of R and R^2 were 0.670 and 0.448 respectively. The R value of 0.670 showed that there is a positive linear relationship between SCI dimensions and organizational performance. The R^2 value indicated that the explanatory power of the SCI dimensions (as a

variable) was 0.448. This means that 44.8% of the variation in organizational performance in KEMSA was explained by the model $\mathbf{Y= \beta_0 + \beta_1X_1+ \beta_2X_2+ \beta_3X_3+ \beta_4X_4+ e.}$

Table 4.16 Supply Chain Integration and Organization Performance

a) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.670[a]	.448	.417	.330

b) ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.286	4	1.571	14.432	.000[b]
	Residual	7.731	71	.109		
	Total	14.017	75			

c) **Coefficients[a]**

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.788	.271		10.274	.000
	Supplier Integration	.162	.039	.387	4.140	.000
	Internal Integration	.140	.038	.343	3.646	.001
	Customer Integration	.087	.040	.194	2.146	.035
	Information Integration	.085	.039	.199	2.207	.031

a. Dependent Variable: Performance

b. Predictors: (Constant), Information Integration, Supplier Integration, Customer Integration, Internal Integration

The results of the study reveal that there is positive and statistically significant relationship between the joint SCI dimensions and organizational performance (p-value= 0.000< 0.05). The results revealed that there is a positive and statistically significant relationship between the joint

SCI dimensions and organizational performance. The study established the joint influence of supplier integration, customer integration; internal integration on organizational performance was greater than that of their individual influence.

The Regression Model is Y= 2.788+0.162X1+0.140X2+0.087X3+0.085X4

Where: Y is organization performance

X_1 is supplier integration

X_2 is internal integration

X_3 is customer integration

X_4 is information integration

The results are consistent with the findings of several scholars (Rosenzweig, 2009; Msimangira, 2014; Bowersox *et al.*, 2003; Frohlich and Westbrook, 2001; Koufteros *et al.,* 2005 and Gimenez & Ventura, 2005) which established that that a greater level of supply chain integration leads to better firm performance. This is achieved through reduced transaction costs through the reduction of uncertainties. On one hand, higher-level supply chain integration is usually related with fewer suppliers, which can lead to economies of scale for suppliers; this in turn reduces material and product costs. On the other hand, empirical studies done by numerous scholars (Shin *et al.*, 2000; Frohlich and Westbrook, 2001; Frohlich, 2002; Sanders and Premus, 2005; Devaraj *et al.*, 2007) show that supply chain integration is helpful in reducing inventory and improving delivery speed, quality, and customer service through sharing information and working together with suppliers which in return enhances firm performance.

4.7 Summary of Hypotheses Tested

The general objective of the study was to establish the effect of supply chain integration on organizational performance. To realize this objective, the study determined the effect of supplier integration; assessed the effect of internal integration; established the effect of customer integration and determined the influence of information integration on organizational performance. Corresponding hypotheses were formulated and tested. The summary of the results are as presented in table 4.17.

Table 4.17: Summary of Hypotheses Tested

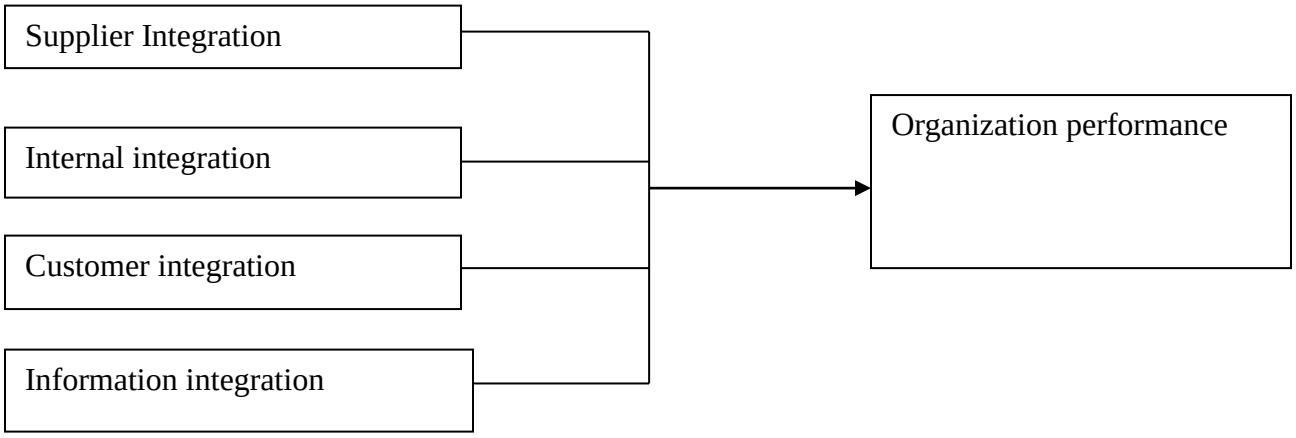
Hypothesis	**p-value**	**Decision**	**Conclusion**
$H_{01:}$ There is no significant relationship between Supplier integration and Organizational performance	P=0.000	Reject H_{01}	There exists a statistically significant relationship between supplier integration and organizational performance
H_{02}:There is no significant relationship between Internal Integration and Organizational performance KEMSA	P=0.000	Reject H_{02}	There exists a statistically significant relationship between internal integration and organizational performance
$H_{03:}$There is no significant relationship between Customer Integration and Organizational performance	P=0.038	Reject H_{03}	There exists a statistically significant relationship between Customer integration and organizational performance

H_{04}:There is no significant relationship between Information integration and Organizational performance	P=0.155	Fail to Reject H_{04}	There is no statistically significant relationship between information integration and organizational performance

4.8 The Revised Conceptual Framework

Based on the outcomes of the regression analysis, the following figure represents the revised conceptual model for the study. Three (supplier integration, internal integration & customer integration) out of the four independent variables were found to be valid predictors of organizational performance with information integration being declared redundant. However, in the overall regression analysis, information integration was found to be significant at a p value of 0.31. This can be explained as a suppression effect where this variable was strengthened by other variables. Of the four independent, supplier integration explained the largest variation (0.162) of variation in organization performance followed closely by Internal integration (0.140) while customer integration explained (0.87) and information integration explained (0.85) of variation in organizational performance. The overall effect of supply chain integration dimensions on organizational performance explained 44.8% of variation in organization performance in KEMSA.

The revised conceptual model is presented in the figure 4.1 below.



Independent Variable **Dependent variable**

Figure 4.1: Revised Conceptual Framework

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter presents a summary of the findings, conclusions and recommendations of the study. The chapter further provides the implications of the findings to theory and practice. Finally, the chapter discusses the limitations of the study and provides recommendations that future studies should consider. The structure of the chapter is guided by the research objectives and corresponding hypotheses.

5.1 Summary of the Findings

This section presents a summary of the findings of the study. There were five objectives out of which five corresponding hypotheses were developed and tested. The general objective of the study was to establish the effect of supply chain integration on organizational performance. Specifically, the study determined the effect of supplier integration; assessed the effect of internal integration; established the effect of customer integration and determined the influence of information integration on organizational performance. Additionally, the study also established the influence of overall supply chain integration dimensions on organizational performance.

5.1.1 Supplier Integration and Organizational Performance

The first objective of the study sought to determine the significance of the relationship between supplier integration on organizational performance and was addressed by testing hypothesis H_{01}: There is no significant relationship between supplier integration and organizational performance.

The value of R and R^2 were 0.505 and 0.255 respectively. The R value of 0.505 showed that there is a positive linear relationship between SI and organizational performance whereas the R^2 value (0.255) indicated means that 25.5% of the variation in organizational performance is explained by supplier integration. The findings led to failure to reject the hypothesis H_{01}. This finding confirms the theoretical propositions of Stakeholders' theory. The findings also compare well with previous empirical studies.

5.1.2 Internal Integration and Organizational Performance

The second objective of the study was to establish the influence of internal integration on organizational performance. The objective was addressed by testing hypothesis H_{02}: There is no significant relationship between Internal Integration and organizational performance. The findings of this study indicate that there is a positive and statistically significant relationship between internal integration and organizational performance. The R value of 0.506 showed that there was a positive linear relationship between internal integration and organizational performance. The R^2 (0.256) value indicated that the explanatory power of the independent variable was 0.256. This means that 25.6% of the variation in organizational performance was explained by internal integration. The finding leads to the rejection of the hypothesis H_{01} and conclude that internal integration is a good predictor of organizational performance. These findings confirm the theoretical propositions of Transactional Cost theory. The findings also compare well with other previous empirical studies.

5.1.3 Customer Integration and Organizational Performance

The third objective of the study aimed at establishing the influence of Customer Integration on the Organizational performance. This objective was addressed by testing hypothesis H_{03}: There

is no significant relationship between Customer Integration and organizational performance. The R value of 0.238 showed that there was a positive linear relationship between Customer Integration and Organizational performance. The R^2 value indicated that the explanatory power of the independent variable was 0.057. This means that 5.7% of the variation in organizational performance was explained by customer integration. The results lead to the rejection of the hypothesis H_{03} and conclude that Customer Integration is a predictor of organizational performance in KEMSA.

5.1.4 Information Integration and Organizational Performance

The fourth objective of the study sought to establish the effect of information Integration on Organizational performance. To test this relationship, the study hypothesized H_{04}: There is no significant relationship between Internal Integration and organizational performance. The results of the survey revealed R and R^2 value of 0.165 and 0.027 respectively. The value of R and R2 were 0.329 and 0.108 respectively. The R value of 0.165 showed that there was a positive linear relationship between information integration and organizational performance. The R^2 value (0.027) indicated that the explanatory power of the independent variable was 2.7% but it was insignificant (p-value=.155). This result leads to the failure to reject the null hypothesis H04 and conclude that information integration is not a predictor of organizational performance at KEMSA.

5.1.5 Overall regression of Supply Chain Integration Dimensions on Organizational Performance

The results revealed a statistically significant relationship between joint SCI dimensions and organizational performance. The R and R^2 value was 0.670 and 0.448 respectively. The R value

of 0.670 showed that there was a positive linear relationship between joint SCI dimensions and organizational performance while the R^2 value (0.448) indicated that 44.8 % of performance was explained by the joint SCI dimensions. The results also indicated that the joint influence of supply chain integration dimensions was higher than that of individual influence.

5.2 Conclusions

The primary objective of this research was to assess the association between supply chain integration and organizational performance. This was done through exploring the supply chain integration dimensions using the process-based management and transaction cost theories. This study examined the relationship between supplier integration; internal integration, customer integration and information integration and organization performance. A conceptual model was developed and empirically tested these relationships.

The descriptive statistics indicate that KEMSA certainly continues to pursue supply chain integration through supplier integration, internal integration, customer integration and information integration. The descriptive statistics again indicate that KEMSA seeks to continuously improve its organizational performance through implementing various supply chain strategies. In addition, the descriptive statistics show that the integration of supply chain has proven to be a critical success factor for the company's performance. Most respondents agreed that when strategy and practice are properly combined, the firm performances improve.

On the regression statistics, it was revealed that supplier integration had a positive and statistically significant influence on organization performance. Internal integration not only improves customer satisfaction but also improves customer order fulfillment processes, in which all activities, functions, and departments involved in fulfilling the order are integrated which in turn shorten production time, reduce development costs, and increase the speed to market, which in turn improves firm performance.

The regression analysis on internal integration also showed that it has a positive and statistically significant effect on organizational performance. Similarly, it was revealed that customer integration has a positive and statically significant influence on organization performance. Therefore, these results lead to the conclusion that greater level of supplier, internal and customer integration complements organization performance in KEMSA. However, the relationship between information integration and organization performance was statistically insignificant.

5.3 Recommendations

Based on the study's findings, the following recommendations are made;

The study recommends for enhanced utilization of supplier integration approaches to enhance organizational performance in reducing not only the transactional cost but also improving process efficiency. Through integration with suppliers, organizations share order and inventory information with suppliers, cross-functional integration of key business processes helps suppliers prepare high-quality materials and services on time which ultimately enhances organizational

performance. The study also recommends for the strategic use of internal integration and customer integration as a policy tool for coordination, production planning and scheduling, customer order management, and demand planning in order to enhance organization performance.

5.4 Research Contribution to Theory and Practice

The debate on supply chain integration is incomplete. Extant literature on supply chain integration is largely driven by the typical view that a greater level of integration leads to better firm performance. However, some scholars continue to raise doubts on the effect of supply chain integration on organization performance.

This study sought to empirically establish this relationship. The study results will not only stimulate deeper academic discourse on supply chain integration and firm performance but also have contribution to theory and practice. This study was mainly anchored on Processes-based management Theory and Transaction cost theory. On one hand, the study established that Process based-management theory is an elaborate theory in describing supply chain integration from an organization view point where supply chain integration is recognized as a process-based initiative whereby supplier integration, internal integration customer integration and information integration are processes. On the other hand, the study established the diversity of transactional cost theory in explaining organizational performance. The study also makes contribution to public management practice by establishing that supplier integration, internal integration and customer integration complements organizational performance.

5.5 Future Research

This research was primarily focused on assessing the relationship between supply chain integration and performance of KEMSA which is a state owned organization. The study can be replicated in the future in a private sector to establish if similar results can be achieved. Alternatively, future research can use longitudinal design to establish whether similar results can be replicated since this study used a cross sectional study research design which is associated case subjectivity.

REFERENCES

Albrecht, K. (2011). Organizational Performance. Meeting the Challenges of the New Business Environment.

Amemba, C. (2013). The Effect of Implementing Risk Management Strategies on Supply Chain Performance: A Case of Kenya Medical Supplies Agency. *Journal of Business and Management*, *5*(14), 42–56.

Aronovich, Gelfeld, D., & Kinzett, S. (2011). Kenya Assessment of the Health Supply Chain and the role of KEMSA.

Bagchi, P. ., & Soerensen, L. (2005). Supply Chain Integration: a European survey. *Journal of Logistics Management*, *16*(1), 275–294.

Bakker, E., Schotanus, F., & Harland, C. (2008). Choosing an Organisational Form: The Case of Collaborative Procurement Initiatives. *International Journal of Procurement Management*, (1), 297–317.

Bowersox, D. (1998). *Logistics Management* (3rd ed.). New York: Macmillan.

Bozarth, C., Warsing, D., Flynn, B., & Flynn, E. (2009). The Impact of Supply Chain Complexity on Manufacturing Plant Performance. *Journal of Operations Management*, *27*, 78–93.

Bruijn, H. (2007). *Managing Performance in the Public Sector* (2nd ed.). London: Rout ledge.

Chang, C., Chiang, D., & Pai, F. (2012). Cooperative Strategy in Supply Chain Networks. *Industrial Marketing Management*, (41), 1114–1124.

Childhouse, P., & Towill, D. (2003). Simplified Material Flow Holds the Keyto Supplychain Integration, *31*(1), 17–27.

Cooper, D., & Schindler, P. (2004). *Business Research Methods* (9th ed.). New Delhi- India: McGraw-Hill Publishing, Co. Ltd.

Creswell, J. (2013). Qualitative Inquiry and Research Design.

Daft, R. (2004). *Organization Theory and Design* (8th ed.). Cincinnati, OH: Southwestern.

Day, G. (2000). Managing Market Relationships. *Journal of the Academyof Marketing Science*, *28*(1), 24–30.

Drucker, P. (1998). *Strategic Dimension of the Supply Chain, Transport Logistics* (3rd ed.).

Fawcett, S., & Magnan, G. (2002). The Rhetoric and Reality of Supply Chain Integration. *International Journal of Physical Distribution and Logistics Management*, *32*(5), 339–361.

Flynn, B., Huo, B., & Zhao, X. (2010). The Impact of Supply Chain Integration on Performance: A Contingency and Configuration Approach. *Journal of Operations Management*, *28*(1), 58–71.

Friedman, A., & Miles, S. (2006). *Stakeholders: Theory and Practice*. Oxford University Press.

Frizelle, R., Efstathiou, G., Sivadasan, S., & Calinescu, A. (2002). An Information-Theoretic Methodology for Measuring the Operational Complexity of Supply-Customer Systems. *International Journal of Operations & Production Management*, *22*(1), 80–102.

Frizlle, G., & Efstathiou, J. (2003). *The Urge to Integrate", Manufacturing Engineer* (Vol. 82). Retrieved from https://books.google.com/books?isbn=1402087411

Frohlich, M., & Westbrook, R. (2001). Arcs of Integration:an International Study of Supply Chain Strategies. *Journal of Operations Management*, *19*(2), 185–200.

Gall, M., Gall, P., & Borg, W. (2007). *Educational Research: An Introduction* (6th ed.). White Plains, NY, England: Longman Publishing.

Germain, R., & Karthik., N. (2006). The Interaction of Internal and Downstream Integration and Its Association with Performance. *Journal of Business Logistics*, *27*(2), 29–52.

Gimenez, C., van Der Vaart, T., & Van Donk, D. (2012). Supply Chain Integration and Performance: The Moderating Effect of Supply Complexity. *International Journal of Operations & Production Management*, *32*(5), 583–610.

Gimenez, C., & Ventura, E. (2005). Logistics-Production,logistics-Marketing and External Integration, Their Impact on Performance. *International Journal of Operations &Production Management*, *25*(1), 20–38.

Hair, J., Black, W., Babin, B., & Anderson. (2010). *Multivariate Data Analysis*.

Hakansson, H., & Ford, D. (2002a). How Should Companies Interact in Business Networks. *Journal of Business Research*, *55*(2), 133–139.

Hakansson, H., & Ford, D. (2002b). How Should Companies Interact in Business Networks. *Journal of Business Research*, *55*(2), 133–139.

Hammer, M. (2001). The Superefficient Company. *Harvard Business Review*, *79*(8), 82–89.

Hammer, M., & Champy, J. (1993). *Reengineering the Corporation*. New York: Harper Collins Books.

Harland, C. (1996). *Supply Chain Management, Purchasing and Supply Management, Logistics,vertical Integration, Materials Management and Supply Chain Dynamics*. Blackwell, UK.: Blackwell Encyclopedic Dictionary of Operations Management.

Heinrich, C. (2007). *Measuring Public Sector Performance and Effectiveness, in B.g. Peters and J. Pierre (eds) the Handbook of Public Administration*. London: Sage.

Hosseini, S., Azizi, S., & Sheikhi, N. (2012). An Investigation on the Effect of Supply Chain Integration on Competitive Capability: An Empirical Analysis of Iranian Food Industry An Investigation on the Effect of Supply Chain Integration on Competitive Capability: An Empirical An Investigation on the Effect of Supply Chain Integration on Competitive

Capability: An Empirical Analysis of Iranian Food Industry. *International Journal of Business and Management*, *7*(5).

Hosseini, S. M., Azizi, A., & Sheikhi, N. (2012). An Investigation on the Effect of Supply Chain Integration on Competitive Capability: An Empirical Analysis of Iranian Food Industry. *International Journal of Business and Management*, *7*(5).

Jespersen, B., & Larsen, T. (2005). *Supply Chain Management – in Theory and Practice* (1st ed.). Copenhagen.

Johnson, M., Hazemba, O., Kimeu, J., Kirika, R., & Thuo, M. (2008). Assessment of Kenya Medical Supplies Agency.

Kariuki, P., Awino, Z., & Ogutu, M. (2012). Firm Strategy, Business Environment and the Relationship Between Firm Level Factors and Performance. *Journal of Department of Business Administration*, *2*(1), 95–122.

Kasunic, M. (2005). *Designing an Effective Survey*. Pittsburgh: Carnegie Mellon Software Engineering Institute.

Kim, W., & Narasimhan, R. (2002). Information System Utilization in Supply Chain Integration Efforts. *International Journal of Production Research*, *40*(18), 4585–4609.

Kiplangat, J., & Kiarie, D. (2015). Effect of Supplier Management Practices on Supply Chain Performance Among State Corporations in Kenya: Case Study of the Kenya Medical Supplies Authority. *International Journal of Innovative Social Sciences & Humanities Research*, *3*(2), 69–85.

Kothari, C. (2008). *Research Methodology: Methods and Techniques* (2nd ed.). New Dehli: New Age International Publishers.

Koufteros, X. (1999). Testing a Model of Pull Production: A Paradigm for Manufacturing Research Usingstructural Equation Modeling. *Journal of Operations Management*, *17*(3), 467–488.

Koufteros, X., Cheng, T., & Lai, K. (2007). ."black-Box" and "gray-Box" Supplier Integration in Product Development: Antecedents, Consequences and the Moderatingrole of Firm Size. *Journal of Operations Management*, *25*(3), 847–870.

Koufteros, X., Vonderembse, M., & Jayaram, J. (2005). Internal and External Integration for Product Development: The Contingency Effects of Uncertainty, Equivocality, and Platform Strategy. *Journal of Operations Management*, *36*(1), 97–133.

Kulp, S., Lee, H., & Ofek, E. (2004). Manufacturer Benefits from Information Integration with Retail Customers. *Management Science*, *50*(4), 431–444.

Lambert, D. (2008). *Supply Chain Management: Processes, Partnerships, Performance* (3rd ed.). Supply Chain Management Institute.

Langat, K. (2013). An Implementation of Inbound Logistics Management on Public Procurement Performance at Public Institutions in Kenya: A Case Study of Kenya Medical Supplies Agency. *International Journal of Social Sciences and Entrepreneurship*, *1*(3), 90–101.

Lee, C., Kwon, I., & Severance, D. (2007). Relationship Between Supply Chain Performance and Degree of Linkage Amongsupplier, Internal Integration, and Customer. *Supply Chain Management: An International Journal*, *12*(6), 444–452.

Lee, H. . (2000). Creating Value Through Supply Chain Integration. *Supply Chain Management Review*, *4*(1), 30–36.

Lee, H., So, K., & Tang, C. (2000). The Value of Information Sharing in a Two-Level Supply Chain. *Management Science*, *46*(5), 626–643.

Lee, H., & Whang, S. (2004). *E-business and Supply Chain Integration* (Vol. 62). New York: Springer.

Leuschner, R., Rogers, D., & Charvet, F. (2013). A Meta-Analysis of Supply Chain Integration and Firm Performance. *Journal of Supply Chain Management*, *49*(2), 34–57.

Liu, H., Kee Wei, K., & Hua, Z. (2013). Effects of Supply Chain Integration and Market Orientation on Firm Performance:evidence from China. *International Journal of Operations & Production Management*, *33*(3), 322–346.

McNichols, T., & Brennan, L. (2006). Partner Suitability for Collaborative Supply Networks. , *Int. J. Networking and Virtual Organizations*, *3*(2), 220–237.

Msimangira, B. (2010). Supply Chain Integration Operational Issues: Impact on Supplier Relationships and Order Fulfilment in New Zealand Public Hospitals. In *Supply chain integration operational issues*. Vancouver, Canada: Annual Production and Operations Management Society.

Mugenda, O., & Mugenda, A. (2003). *Research Methods: Quantitative and Qualitative Approaches*. Nairobi,Kenya: Acts Press.

Nachmias, C., & Nachmias, D. (2008). *Research Methods in Social Science* (5th ed.). London: St. Martin Press, Inc.

Narasimhan, R., & Kim, S. (2001). Information System Utilization Strategy for Supply Chain Integration. *Journal of Business Logistics*, *22*(2), 51–75.

Nathalie, F., & Marianne, J. (2008). Supply Chain Integration and Performance: A Review of the Evidence. *International Journal of Logistics Management*, *19*(2), 130–154.

Njagi, M., & Ogutu, M. (2014). Role of Supply Chain Integration on Supply Chain Performance in Kenyan State Corporations. *International Journal of Current Business and Social Sciences*, *1*(2).

Ohemeng, K. (2009). Constraints in the Implementation of Performance Management Systems in Developing Countries: The Ghanaian Case. *International Journal of Cross Cultural Management*, *9*(1), 109–132.

Orodho, J. (2005). *Elements of Education and Social Science Research Methods*. Nairobi: Masola Publishers.

Peck, H. (2005). Drivers of Supply Chain Vulnerability: An Integrated Framework. *International Journal of Physical Distribution & Logistics Management*, *35*(4), 210–232.

Richey, R., Roath, A., Whipple, J., & Fawcett, S. (2010). Exploring a Governance Theory of Supply Chain Management: Barriers and Facilitators to Integration. *Journal of Business Logistics*, *31*(1), 237–256.

Saunders, M., Lewis, P., & Thornhill, A. (2003). *Research Methods for Business Students* (5th ed.). England: Pearson Education Limited.

Sekaran, U., & Bougie, R. (2009). *Research Methods for Business: A Skill-Building Approach* (5th ed.). Hoboken: John Wiley and Sons Inc.

Shuttleworth, M. (2008). Descriptive Research Design. Retrieved from http://explorable.com/descriptive-research-design

Snow, J. (2012, January). Th Jsi Framework for Integrated Supply Chain Management in Public Health.

Stank, T., Keller, B., & Closs, D. (2001). Performance Benefits of Supply Chain Integration. *Transportation Journal*, *41*(2), 31–46.

Storey, J., Emberson, C., Godsell, J., & Harrison, A. (2006). Supply Chain Management: Theory, Practiceand Future Challenges. *International Journalof Operations & Production Management*, *26*(7), 754–774.

Swink, M., Narasimhan, R., & Wang, C. (2007). Managing Beyond the Factory Walls: Effects of Four Types of Strategic Integration on Manufacturing Plant Performance. *Journal of Operations Management*, *25*(1), 148–164.

Tate, W., Ellram, L., & Brown, S. (2009). Offshore Outsourcing of Services: A Stakeholder Perspective. *Journal of Service Research*, *12*(1), 56–72.

Teelken, C., & Smeenk, S. (2003). Toward a Single Quality Assessment System in Higher Education: Composing an Outline for International Comparative Quality Assessment, European Conference on Educational Research. University of Hamburg. Retrieved from http://www.leeds.ac.uk/educol/documents/00003538.htm.

Trochim, W. (2000). The Research Methods Knowledge Base. Retrieved from http://www.socialresearchmethods.net/kb/

Vaart, T., & Donk, D. (2008). A Critical Review of Survey-Based Research in Supply Chain Integration. *International Journal of Production Economics*, *111*(3), 42–55.

Vallet-Bellmunt, T., & Rivera-Torres, P. (2013). Integration: Attitudes, Patterns and Practices. Supply Chain Management. . *Supply Chain Management: An International Journal*, *18*(3), 308–323.

Verbeeten, F., & Boons, A. (2009). Strategic Priorities, Performance Measures; an Empirical Analysis in Dutch Firms. *European Management Journal*, *27*, 113–128.

Vickery, S., Jayaram, J., Droge, C., & Calantone, R. (2003). The Effects of an Integrative Supply Chain Strategy on Customer Service and Financial Performance: An Analysis of Direct Versus Indirect Relationships. *Journal of Operations Management*, *21*(5), 523–539.

Wellenbrock, M. (2013). *Theoretical Basis of Supply Management the Network Theory in Supply Management*. University of Twente, Netherlands.

Wong, C., Boon-itt, S., & Wong, C. (2011). The Contingency Effects of Environmental Uncertainty on the Relationship Between Supply Chain Integration and Operational Performance. *Journal of Operations Management*, *29*, 604–615.

Yadav, P. (2014). Kenya Medical Supplies Authority (kemsa) a Case Study of the Ongoing Transition from an Ungainly Bureaucracy to a Competitive and Customer Focused Medical Logistics Organization.

Yadav, S., Nishikani, K., & Tiwari, M. (2014). A Framework for Designing Robust Supply Chains Considering Product Development Issues. *International Journal of Production Research*, *3*(49), 6065–6088.

Yang, S. (2007). The Integration Model of the Internal Supply Chain.

Zhao, X., Flynn, B., & Roth, V. (2007). Decision Sciences Research in China: Current Status, Opportunities, and Propositions for Research in Supply Chain Management, Logistics, and Quality Management. *Decision Sciences*, *38*(1), 39–80.

Zhao, X., Huo, B., Flynn, B., & Yeung, Y. (2008). The Impact of Power and Relationship Commitment on the Integration Between Manufacturers and Customers in a Supply Chain. *Journal of Operations Management*, *26*(1), 366–388.

Zhao, X., Huo, B., Selen, W., & Yeung, Y. (2011). The Impact of Internal Integration and Relationship Commitment on External Integration. *Journal of Operations Management*, *29*(2), 17–32.

Zhao, Z., Anand, J., & Mitchell, W. (2005). A Dual Networks Perspective on Inter-Organizational Transfer of R&D Capabilities: International Joint Ventures in the Chinese Automotive Industry. *Journal of Management Studies*, *42*(1), 127–160.

Zhou, H., & Benton, W. (2007). Supply Chain Practice and Information Sharing. *Journal of Operations Management, 25,* 1348–1365.

Zinbarg, M. (2005). *Research Methods* (1st ed.). New Jersey.: Pearson Publishers.

APPENDICES

APPENDIX II: DATA COLLECTION QUESTIONNAIRE

This questionnaire aims to collect data from Kenya Medical Supplies Authority with the goal of examining the effects of supply chain integration on organizational performance. To achieve this, objective questions have been provided to gather data for analysis. Kindly spare some time to provide the requested information as accurately as possible. Data obtained will be held in confidence and identity of respondents will be kept anonymous.

SECTION A: DEMOGRAPHIC PROFILE OF RESPONDENTS

1. Kindly indicate your highest academic qualification. Please (√) as appropriate

None	[ ]
College Certificate	[ ]
College Diploma	[ ]
Bachelors' degree	[ ]
Masters Degree	[ ]
Any other	[ ]

2 Kindly indicate your years of experience in supply chain profession. Please (√) as appropriate.

Below 1 year	[ ]
Between 1 and 4 years	[ ]
Between 5 and 9 years	[ ]
Between 10 and 14 years	[ ]
Over 15 years	[ ]

SECTION B: SUPPLY CHAIN INTEGRATION AND ORGANIZATIONAL PERFORMANCE

PART ONE: Supplier Integration

The following statements relate to supplier integration characteristics of organizations. Kindly indicate the extent to which each of the statement match supplier integration traits in your organization. Please (√) as appropriate

Statement	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
Our supplier relationship is largely collaborative.					
We normally use early supplier involvement approach in our procurement processes					
We engage in supplier development programs					

PART TWO: Internal Integration

The following statements relate to internal integration characteristics of organizations. Kindly indicate the extent to which each of the statement match internal integration traits in your organization. Please (√) as appropriate

Statement	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
We fulfill our customers' orders in time					
We hardly had any orders returned by customer in the past 1 year					
We hardly have any stock-out occurrences in our organization					

PART THREE: Customer Integration

The following statements relate to customer integration characteristics of organizations. Kindly rate the extent to which each of the statement matches customer traits in your organization. Please (√) as appropriate

Statement	**Strongly Disagree (1)**	**Disagree (2)**	**Neither Agree nor Disagree (3)**	**Agree (4)**	**Strongly Agree (5)**
Our customer satisfaction index improved in the past financial year					
We timely resolved customer complaints in the past financial year					
We hardly have any stock-out occurrences in our organization					

PART THREE: Information Integration

The following statements relate to information integration characteristics of organizations. Kindly rate the extent to which each of the statement matches information integration traits in your organization. Please (√) as appropriate

Statement	**Strongly disagree(1)**	**Disagree (2)**	**Neither Agree nor Disagree (3)**	**Agree (4)**	**Strongly Agree (5)**
We share high quality information internally to facilitate operation and management					
We share high quality level of information with suppliers.					

The quality of information shared with other functional departments is high					
The quality of information shared with customers					
We share timely information with our customers and suppliers					

SECTION C: PERFORMANCE OF KEMSA

The following statements relate to performance characteristics of organizations. Kindly indicate the extent to which each of the statement match performance traits in your organization. Please (√) as appropriate.

Statement	**Strongly Disagree(1)**	**Disagree (2)**	**Neither Agree nor Disagree(3)**	**Agree (4)**	**Strongly Agree (5)**
We reduced operational wastes in our organization in the past year					
We reduced time taken to meet our customer requirements in the past financial year.					
Our cost per unit input reduced in the past financial year					
We reduced medical channel cost in the past financial year.					

Statement	Strongly Disagree(1)	Disagree (2)	Neither Agree nor Disagree(3)	Agree (4)	Strongly Agree (5)
We decreased channel inventory in the past financial year.					
We increased product quality to our customers					
We improved our delivery timeliness in the past financial year.					
We increased our flexibility in meeting customers' orders in the past financial year.					

END OF THE QUESTIONNAIRE

Thank You for Participating in the Research